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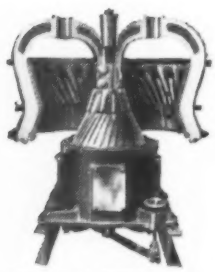

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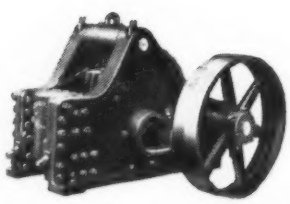

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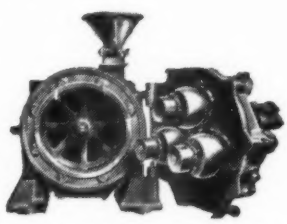

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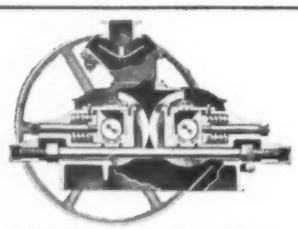

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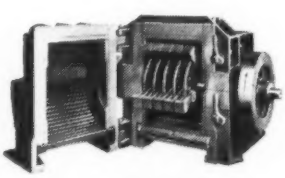

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RUBBER FOR INDUSTRY

ROCK PRODUCTS
THE INDUSTRY'S RECOGNIZED AUTHORITY
OCTOBER, 1948 VOL. 51, No. 10

Ralph S. Torgerson, *Managing Editor*
Bror Nordberg, *EDITOR*
Nathan C. Rockwood, *Editorial Consultant*

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"WE HEAR..."

October, 1948

Supplies of building materials in 1948 will top 1947 about 5 percent, the Department of Commerce has estimated; however, 5 percent more materials won't quite meet the 29 percent rise in value of construction.

* * * * * * * * * * * *

Apportionment of $20,000,000 for construction of forest highways in states containing national forest areas, for the fiscal year ending June 30, 1950, under authorization of the Federal Aid Highway Act of 1948, has been announced by Federal Works Administrator Maj. Gen. Philip B. Fleming. Also announced was apportionment to the States of $6,250,000, the last of the funds authorized by the Federal-aid Highway Act of 1944 for improvements on the primary and secondary Federal-aid systems.

* * * * * * * * * * *

Apprentices employed in the construction industry reached an all-time high of 132,114 on July 1, the Bureau of Apprenticeship reports. This is an increase of 32,000 over the same date a year ago.

* * * * * * * * * * *

The 1948 construction boom continues unchecked as shown by Department of Commerce preliminary totals for August. Value put in place on all types of construction was the highest for any month on record--$1,785,000,000 or 31 percent above August, 1947--with housing a leading factor in the gains. Work done on houses in August was valued at $690,000,000, topping the previous record of $667,000,000 in July, and rising over last year by 38 percent.

* * * * * * * * * * *

A new type tire tread treated with ordinary rock salt for use on ice-covered roads has been developed by United States Rubber Co., and is said to give as much as 30 percent better traction on icy highways than conventional treads.

* * * * * * * * * * *

An employer cannot safely discharge or lay off employes because they refuse to sign a statement that you may dismiss them at any time with or without cause. A circuit court of appeals upheld a National Labor Relations Board order calling for back pay for 212 employes of a company who were laid off for refusing to sign such a form after a union-organizing drive began in the plant. The employer was held to have interfered with the organizational rights of the workers.

* * * * * * * * * * *

Conversion of brick and tile production in America to new modular sizes is continuing at a rapid rate. Already 125 manufacturers of structural clay products, manufacturing 40 percent of the nation's brick and tile, are producing modular sizes today, or will produce them on order. Concrete products manufacturers also have turned to modular sizes.

* * * * * * * * * * *

Asbestos filter pads may prove to be a boon to fruit juice manufacturers. Until now, it was not thought possible to preserve the juices of fruits of low alcohol content except by pasteurization or by the addition of chemical preservatives. Asbestos filters sterilize simply by eliminating entirely all the fermentation yeasts and bacteria by means of the unusual, but natural, composition of asbestos. Value of such sterilization is absolute preservation of natural aroma, taste, color and nutritive materials.

WE HEAR

The building industry is due for an investigation by a government-appointed fact-finding committee which has four main jobs: (1) to look into the organization and efficiency of the industry; (2) to study professions related to building; (3) to scrutinize the industry's financing operations; and (4) to examine types of contracts used by builders.

* * * * * * * * * * *

Reclamation engineers and administrators outlined a budget of $250,000,000 in construction for the next 12 months, representing the largest construction program in the 46-year history of the Bureau.

* * * * * * * * * * *

A survey by American Road Builders' Association shows that highway programs of the 48 state highway departments and the District of Columbia call for the building of 46,821 miles of state and federal highways during 1948 at an estimated cost of $1,072,283,810. Included in the 46,821 miles to be built are 3414 miles of concrete roads and 25,631 of bituminous mixes and treated types.

* * * * * * * * * * *

Time spent by employes in collective bargaining and discussing grievances, etc., should be considered as time worked, according to the Wage-Hour Administrator. The Taft-Hartley Act does not change the Wage-Hour ruling that this time counts as part of the work week, and employers must treat it as such.

* * * * * * * * * * *

Construction employment was higher in July than for any corresponding month since 1942, the Labor Department reports. July was the fifth straight month of such increases, with 2,186,000 workers employed by contractors.

* * * * * * * * * * *

Physical output per man hour at present exceeds that of a year ago for some two-thirds of all companies cooperating in a survey conducted by the National Industrial Conference Board. Most frequently mentioned factors contributing to the higher level of productivity are improved equipment and tools.

* * * * * * * * * * *

Total money supply, in the form of bank deposits or currency held by business firms or individuals, now is $165,600,000,000, compared with $63,200,000,000 in 1939, just before World War II. Less than one fourth of this rise has occurred since the end of the war in 1945. However, the big supply of money is turning over more rapidly, adding to inflation.

* * * * * * * * * * *

Highway and bridge construction volume, rising to $625,422,000 in the first six months of 1948, is 36 percent above the corresponding period of a year ago and 48 percent above the 1946 six months total, acording to contract awards reported by Engineering News-Record.

* * * * * * * * * * *

Old payroll records that have been kept in connection with the Fair Labor Standards Act for more than three years can now be destroyed. They no longer need to be kept for four years, the Wage-Hour Division of the Labor Department, has announced. There is no change in the two-year holding period for time-cards and similar working records.

* * * * * * * * * * *

State taxes collected on gasoline during 1947 rose 10 percent according to figures compiled by Public Roads Administration. The taxes were collected on 28,407,000,000 gal. of motor fuel during 1947, an increase of 2,539,000,000 gal. over 1946.

* * * * * * * * * * *

Details on how the Corps of Engineers will spend the $612,700,000 for its military program in the fiscal year 1949 show that $151,000,000 will be used for military construction. A breakdown of this total shows that $63,400,000 is earmarked for housing; $64,900,000 for operational facilities, and $22,700,000 for emergency construction.

THE EDITORS

★ ★ Editor's Page

Outlook For Business Continues "Good"

ALL SIGNS seem to indicate that the nation's business will continue at extraordinary high levels for the months ahead but there is now some evidence that production is on the way to catching up with demand.

High cost producers of goods are starting to feel the force of competition and, in sufficient lines, to reflect in margins of profit and to show disparity between businesses as classified according to size. Those classed as marginal producers of materials and goods who absolutely must raise prices whenever their costs increase, in order to survive, are the first to feel the impact of a downward trend in profits that apparently is now starting to affect all but the largest companies.

Statistics disclose that the smallest concerns are having the greatest problem in keeping profits up in proportion to price rises in materials and labor. In one year's time the margin of profit for companies with less than $250,000 volume of business annually declined from 4.7 to 2 cents per dollar of sales. That represents a decline of some 57 percent in real profits—much more than experienced by bigger businesses—and should have significance particularly for modest businesses which must again sometime try to compete with bigger producers.

Marginal Producers Should Make Preparations

Those concerns which must produce nearly to capacity in order to realize any profits at all won't have much margin on which to operate a successful business when their more efficient competitors start looking around for business.

Those engaged in the rock products industries who fit in that classification are probably more fortunate than those in many other lines of endeavor because they have time in their favor. Real competitive selling isn't at hand yet, generally speaking, in these industries, and its timing depends upon many variables that affect the rate of building. Among them are construction prices in their effects on the letting of contracts, the acceleration or diminuation of government subsidies, availability of workers now that men again will be siphoned off for military training, the extent to which the government will undertake construction projects, and a host of other factors.

With construction progressing at a rate some 35 percent over a year ago and no foreseeable end to the extraordinary demands for all sorts of building, high cost operations within the rock products industry can yet be modernized for increased productivity in anticipation of the necessity for competitive selling on a price basis that surely will come and, probably very soon, for some.

As to the timing, the thousands of miles of roads that must be built, the still extremely critical housing shortage and persisting demands for commercial and industrial building of all kinds alone promise to take the output of the industry for years to come. On top of this we are now having superimposed demands for millions of tons of aggregates and millions of barrels of portland cement for the building of dams and flood control projects under government sponsorship.

Factors that Build Excessive Demand

The extent of competition with private enterprise for materials and labor by the government in its postwar building splurge, and, we might add, for the operation of the government itself, will have a lot to do with how soon ordinary demands for construction will be met. Many needed projects are being shelved now by private industry because intensified demands for most everything short in supply have built prices to exorbitant levels. These prospective builders are not lost but will reappear later when prices suit them better and thereby will contribute to a sounder form of economy.

Prices in the building industry and the way they spiraled upward represent true inflation, and their trend has bearing on the duration of the period during which backlog demands will be met. On the surface, there is small wonder that proposals of subsidies, more liberal guarantees of mortgages and other stimulants by government to encourage the building of housing for example, are popular and accepted so often as contributing to solution. The fallacy is that it is not practicable to build more houses than are being built and such inducements can only increase competition for a more or less fixed amount of materials available and workers already employed. The result is still more expensive homes, *not more* of them. What we really need is the elimination of excessive demands, artificially created, in order to attain more quickly efficiency in building, and decent prices that will improve the economy and help increase our standard of living. Yes, business looks good in the years ahead but producers will have troubled times and uncertainties in their efforts to help accomplish too quickly, construction that really cannot be finished until the materials needed are first made.

Bror Nordberg

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Rocky's NOTES

Nathan C. Rockwood

There Need Not Be a Bust

TODAY'S BUSINESS EXECUTIVES have the unique experience of living through two World Wars and their aftermaths. Consequently, they are in a better position than ever before in history to profit from actual experience, and to avoid the dangers of a post-war economy. Probably we shall not again have a "free" economy, in the sense that the term was used prior to 1916, although experience both here and abroad proves that a *government-controlled* economy means the end of American standards of living and of our ideals of democracy.

Everyone expected a return to normal following the first World War, and accepted succeeding developments as necessary. Few industries were willing to invest in new plants or expansion of old ones until some of the easy money was squeezed out of circulation, and men were willing to work in earnest. Even those in charge of highway and other public works construction were unwilling to spend until things began to *look* more normal. This took about three years' time; meanwhile businessmen fretted and stewed—but waited.

There followed a tremendous surge to get goods on the market; and the rock products industry was no exception. With a huge highway program and the need for construction by industry, for homes, for hotels, apartment houses, etc., the demand for construction materials made a sellers' market. After several lean years both before and during the war, the rock products industries had no surplus profits to invest. However, investment money was not hard to obtain but its cost was high. Optimism knew no bounds and many new plants were built—so many in fact that it has taken the intervening 20 years for demand to reach their capacity.

Those new plants built in the post-World War I period were so far superior in every way to older ones, that lower unit labor costs and greater over-all efficiency in many instances permitted them to absorb the costs of construction and pay back the high-priced money. Yet, these industries already had become over-expanded in the five or six years following 1922. As early as 1927 there were many signs of this, and we heard a great deal about "profitless prosperity" and "over production."

The depression of the 1930's restored balance to our economy by violent but perhaps natural methods. Then government stepped in with plans for permanently balancing the national economy—first by assuring farmers of stable prices, or prices related to prices of manufactured goods, regardless of the law of supply and demand. This led to increased costs of living and provided leverage for organized labor to obtain constantly higher wage scales, thereby increasing the prices of goods the farmer buys, and in return increasing again the cost of living. During World War II the attempt to control the prices of nearly everything proved that there can be no successful halfway ground; either we must have a wholly controlled economy, or a relatively free economy. A government controlled economy proves to be one controlled by selfish pressure groups; in a free economy pressure groups are controlled by economic law, which eventually eliminates them.

Present Post-War Period

Our current post-war period has existed about as long as did the one following the first World War before the boom got started; but there are few parallels today other than the fact that there is a great surplus of "war" money. Because there is a lot of money and credit, it is cheap, and there has been a great deal more business activity and construction than during the corresponding period after World War I. Probably because labor is able to resist wage reductions there was no corresponding waiting period. Consequently we are three years ahead in making up the gap between demand and production.

It took only about six years for the productive capacity of this country to catch up with and exceed by a large margin the "normal" demands of the first post-World War period. That fact is foremost in the minds of business executives today. Hence, there is no scramble to build new cement plants, although the demand at the moment exceeds supply, and the industry is vastly better off financially than it was in the early 1920's. The same is true of other rock products industries. New and better plants are being built, but they are largely the rebuilding of existing plants; a few in presently strategic locations. Caution, based on experience, is the primary reason why there is no flood of new money into the industry. Another one is that while the new plants have many improvements in details over those built 25 (or fewer) years ago, they do not represent anywhere near the cost-reducing advances.

A portland cement plant built today at a cost of $6.00 per bbl. of annual capacity, or $6,000,000 for 1,000,000-bbl. plant, would result in a $2,400,000 interest cost in 20 years, even with money at 4 percent, and principal paid off in annual installments in 20 years. The total fixed cost would then average $420,000 per year. An older plant costing $2,500,000 ($2.50 per bbl. of capacity), kept up-to-date by reinvestment of depreciation reserve, but still paying interest on its original investment at 6 percent, under the same kind of a setup, would have an annual interest cost of $162,000. The difference, $258,000, distributed over 1,000,000 bbl., is a *minimum* fixed cost of about 26c per bbl. Assuming all other costs are approximately the same for the two plants, there are indeed few inducements to invest new money in new plants.

Much the same comparison could be made with a plant investment in any of the rock products industries. Obviously, a greater margin of profit must be possible before new plants will be promoted; present demand must be considered permanent; and it must be fairly certain that existing plants be permitted to make profits on their "real worth"— that is present book value—which the government and the public would undoubtedly consider excessive profits. The "out" is to wait until rehabilitation and rebuilding costs of these older plants from reinvestments of current profits, bring their book values up to somewhere near the then depreciated value of the plants now building.

This attitude of business executives should avoid productive capacities again rapidly overtaking demand, resulting in a serious depression. If we have ten or twenty years of peace, we may see a gradual absorption of present excess money and credit in sound investments with simultaneous reduction of the national debt. In other words, the present investment in "war paper" will gradually be converted into sound investment in fixed industrial assets and public works. Unless there is too much political interference with the normal working of economic laws, prices gradually will come down, either through lower cost of living and lower wage scales, or greater unit production per wage earner, probably both. There need not be a bust if we can profit from experience.

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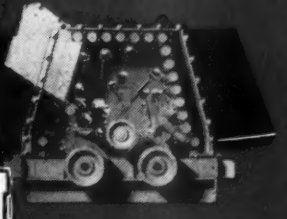


the *Personal Side* of the news

On Research Council

ROBERT BLANKS, director of research, Bureau of Reclamation, Denver, Colo., and ARTHUR J. BOASE, Portland Cement Association, have been appointed members of the Council on Research in Reinforced Concrete, sponsored by the Engineering Foundation. The aim of this Council is to carry out studies and experimental research in reinforced concrete, and to interpret the results in the form of a code for the design of concrete structures. Two investigations have been recommended for immediate consideration by the Council, one at Ohio State University to determine the shape of the stress block in reinforced concrete in the compression zone by means of photoelastic methods, and the other at the University of Illinois will be concerned with reinforced concrete members subject to combined bending and direct stress.

Survey Engineer Retires

JOHN F. DEEDS, principal engineer, Conservation Branch, U. S. Geological Survey, Department of the Interior, Washington, D. C., has retired after 37 years of service with the government. Mr. Deeds is a member of the bar of District of Columbia and plans to practice law in Washington. FRANCIS M. BELL, district engineer for Georgia and Tennessee for more than 11 years, has been appointed district engineer in charge of surface water investigations in Colorado and Wyoming. He succeeds ROBERT FOLLANSBEE who has been district engineer at Denver since 1912. Mr. Follansbee has been engaged on special studies and preparation of reports and in order that this work be completed before his retirement in 1949 has requested that he be relieved of administrative duties.

Lehigh Promotions

ROBERT E. JONES, assistant plant manager and supervising chemist at the Buffalo, N. Y., plant of Lehigh Portland Cement Co., Allentown, Penn., has been appointed manager of the Iola, Kansas, plant, succeeding C. A. Swiggett, who has retired. Mr. Jones is a graduate of Lafayette College in chemical engineering. Prior to joining Lehigh he was supervisor of operations at the Lawrence, Kansas, plant of the Trojan Powder Company.

PHILIP E. CARLSON has been promoted to plant engineer and supervising chemist at the Buffalo plant. He graduated as a chemical engineer from the University of Minnesota and was formerly employed by the Minneapolis-St. Paul Sanitary District. He became associated with Lehigh in 1946.

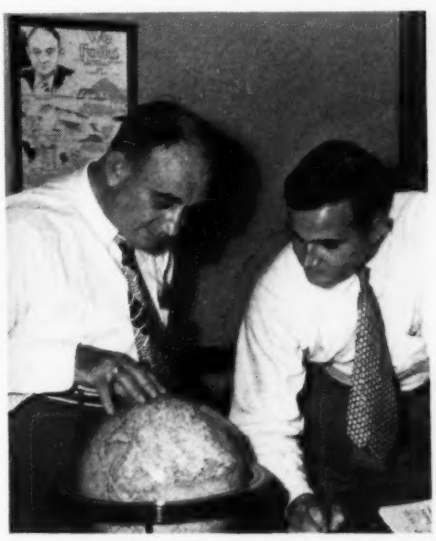
WILLIAM A. HERBSTER, JR., has been appointed chemist at the Sandt's Eddy, Penn., plant, succeeding H. M. Dickenshied, who has retired. Mr. Herbster has been with the company since 1937, starting as a sample carrier. Subsequently he became laboratory helper, laboratory assistant, assistant chemist and now chemist.

C. A. SWIGGETT, who has retired as manager of the Iola plant, had been assistant superintendent at Iola from 1910 to 1916. He left there to go to Independence, Mo., as superintendent of the Western States Portland Cement Co. plant, returning to Iola as superintendent in 1917. Under his guidance, an unbroken safety record was established at the Iola plant for the period 1927 through 1938, which was not surpassed in the cement industry until 1946.

H. M. DICKENSHIED, who has retired as chemist at the Sandt's Eddy plant after 43 years of service, began work for Lehigh in 1905 as a machinist apprentice. When the Fogelsville, Penn., plant was started, he was put in charge of concrete construction, and had the same job when work was started on the plant at Mason City, Iowa. He returned to the Lehigh Valley to be analyst in the laboratory at Ormrod, and from there he went to Sandt's Eddy.

Overseas Travelers

H. X. ESCHENBRENNER, president of the Universal Concrete Pipe Co., Columbus, Ohio, and his son, are on a two months business trip to Europe. They plan to visit France, Belgium, Switzerland, Germany and England. Mr. Eschenbrenner purchased a French Renault automobile for use on the continental trips, which will be sold before they return to the United States in October.



H. X. Eschenbrenner and Son

Operating Manager

E. P. NEWHARD, general chemist at the Nazareth, Penn., plant of the Pennsylvania-Dixie Cement Corp., New York, N. Y., has been appointed operating manager, to succeed Carl J. Lofstedt, who has resigned. Mr. Newhard's early experience includes employment with the U. S. Geological Survey and the Atlas Portland Cement Company at Northampton, Penn., and Hudson, N. Y. He was an assistant and later chief chemist of the Giant Portland Cement Company at Egypt, Penn., and Norfolk, Va., from 1910 to 1918. For the next six years he was chief chemist of the Clinchfield Portland Cement Company at Kingsport, Tenn., and from 1926 to 1932 was chief chemist of the Southern Division of the Pennsylvania-Dixie Cement Corp. In 1944 he was appointed general chemist in charge of chemical control and research at Nazareth, Penn.

Sales Representative

GERALD T. HADDOCK, formerly sales promotion manager, Lumnite Division, Universal Atlas Cement Co., New York, N. Y., has been appointed American sales representative of Lafarge Aluminum Cement Co. Ltd., London, England. Mr. Haddock previously was sales promotion manager of the former Atlas Lumnite Cement Company and has been associated with the cement industry since his first connection with the Portland Cement Association in 1924. Mr. Haddock will make his headquarters in New York City.

Vice-President Retires

HARRY O. WARNER, vice-president and general sales manager of the Ideal Cement Co., Denver, Colo., has retired after more than 33 years of service with the company. He will retain his position as a member of the board of directors. ROBERT W. WINTERS, formerly regional manager of the Portland Cement Association, has been appointed general sales manager.

P.C.A. Field Engineer

WILLIAM J. HAGENLOCHER of North Canton, Ohio, has been appointed field engineer for the Portland Cement Association in central and northeastern Ohio. He will represent the Association in the following counties: Ashtabula, Trumbull, Portage, Summit, Mahoning, Stark, Columbiana, Holmes, Tuscarawas, Carroll, Jefferson, Harrison, Belmont, Knox. Coshocton, Licking, Muskingum, Guernsey, Fairfield and Perry.

Visitors From Abroad

By M. W. LOVING

SVERRE FJELDSTAD, engineer, International Ytong-Stabalite Company, Limited, Stockholm, Sweden, was a visitor in this country for six months in 1948 and has recently returned to Stockholm. His primary interest here was in prestressed concrete structures, including prestressed concrete pressure pipe. The development work his company has underway in Sweden is based on the inventions

Sverre Fjeldstad

of Ewald Hoyer of Germany in 1937, which was not developed commercially in Germany on account of the war. Considerable progress has been made in Sweden, especially in the structural unit field—slabs, beams and the like.

The concrete used to make these units has a compressive strength of 12,000 to 15,000 p.s.i. and the steel wire has a tensile strength of 350,000 to 400,000 p.s.i. ultimate. The working stress of the wire is about 200,000 p.s.i., and because the concrete is always in compression there are no shrinkage cracks, unless the steel is stressed beyond its yield point.

One firm in Sweden, said to be the only one like it in the world, is producing prestressed concrete units on a commercial basis and at a nominal cost. Some of the details of this work are now being translated to English and may be disclosed in a subsequent article.

The high tensile-strength wire, which has diameters of one to two millimeters, used in the manufacture of prestressed concrete units in Sweden is made with steel shipped from the United States, to a considerable extent. I was told here in Chicago that a considerable quantity of this kind of wire is shipped from Sweden to America.

M. O. PIERCE, chief engineer, Pontuso Corporation of Cuba, Havana, Cuba, and Mrs. Pierce were visitors here in July. Mr. Pierce spent the war years, with the American Air Forces in Burma and India; after his discharge he was in France and North Africa for several years before going to Cuba.

On May 19, 1948 I spent the day with Mr. Pierce at the plant where prestressed concrete pressure pipe for water supply is being manufactured for the Cuban Government. Some of my pictures* were published in ROCK PRODUCTS for July 1948, without disclosing where they were taken; a lucid article on this excellent work will be published in ROCK PRODUCTS for November, 1948, and in *Water and Sewage Works* at the same time.

This Cuban project is a joint venture of the United States Pipe and Foundry Co., Burlington, New Jersey and Pont-A-Mousson, Nancy, France; both firms are primarily engaged in the manufacture and sale of cast iron pressure pipe in the United States and France, respectively.

V. M. MESWANI, engineer, Indian Hume Pipe Company, Limited, Bombay, India spent the day with me in Glenview on August 25th; he was in America in 1933, when I first met him. R. Hirachand, managing director of the same firm, and Mrs. Hirachand are also in this country and left for Yellowstone Park the day Mr. Meswani was here.

Educated in England and with extended experience in the manufacture of reinforced concrete pipe in India, Mr. Meswani has also visited other countries and seemed, like the others, surprised at the lack of progress in the concrete pipe business in this country. Processes used here today, including the centrifugal, have been discarded years ago; an improved centrifugal process is used in India which was first developed in Australia

Mr. and Mrs. M. O. Pierce

V. M. Meswani

and used also in England for more than ten years. Concrete of a very dry consistency is used to make the pipe, the water cement ratio is about 0.4; while in the horizontal position, the required amount of concrete is placed in the moulds and is compacted with a heavy roller, which also distributes the concrete from one end of the mould to the other. The mould in the meanwhile is rotating at a low peripheral (rim) speed and is jolted; then the peripheral speed is increased to about 300 f.p.m. and the concrete is thus densified.

The concrete pipe are steam cured, still in the moulds, for about 24 hours. Some of the pipe have been tested for internal hydrostatic pressure when only 24 hours old; one 24 inch pipe with a shell thickness of 2 inches and 8 feet long was tested to 100 psi, without leakage—in this case the steel reinforcement was designed for a working stress of 12,500 psi. But in India this pipe is cured in water, submerged for 21 days, before they are ready for use. With water pipe, the same methods of curing are employed in Australia but they are not submerged for more than seven days; every pipe is tested for internal hydrostatic pressure.

The concrete so produced has a compressive strength of around 15,000 psi and is impermeable, thus has a very long life expectancy; it weighs about 164 pounds per cubic foot. I have a cut-section of some of this kind of concrete, sent last year by the Hume Pipe (Australia) Company, Limited, Melbourne, Australia. It is the best concrete you ever saw anywhere.

In Sweden, Mr. Fjeldstad said the same kind of concrete is made by centrifugal force and high-frequency vibration—simultaneously; the water cement ratio is about 0.4 and thus there is no separation of the cement, fine and coarse aggregates because so little water is used in the concrete mixture. When a plastic or wet mixture is used to make centrifugal pipe,

*M. W. Loving, consulting engineer

the concrete is often un-mixed by centrifugal force; the heavy particles of aggregate are forced to the outer surface of the pipe shell and the light material, including slurry, remains on the inner surface. Likewise, when the wet concrete mixtures are vibrated the heavy material settles to the bottom of the mould and the "Soup" accumulates in the top of the mould. Precision, high-frequeney vibration is used in this country today with the same end results as in Sweden where it was first perfected; dry concrete mixtures are employed with a slump of around one inch, in some cases more or less.

P.C.A. Manager

R. F. DIERKING, district engineer in charge of the Des Moines, Iowa, office of the Portland Cement Association, Chicago, Ill., has been appointed manager of the West Central offices, with headquarters in Kansas City, Mo. Mr. Dierking will succeed R. W. Winters, who has resigned, and will direct field work in Colorado, Kansas, Missouri, Nebraska, Oklahoma and Wyoming. FRED F. LOY, who has been a field engineer in Iowa for the past 11 years, will assume Mr. Dierking's duties as district engineer at Des Moines.

Mr. Dierking has been a member of the Association for more than 20 years, serving as field engineer in Arkansas and Missouri until he became district engineer in Iowa. He studied civil engineering at the University of Missouri and before joining the Association worked for the Missouri State Highway Commission.

Mr. Loy became a member of the staff in 1937 and spent 3½ years as an engineer officer in the Corps of Engineers, U. S. A., serving in World War II from the Normandy landing until 1946. He was retired to inactive duty with the rank of Major.

25-Year Men Entertained

NORTH AMERICAN CEMENT CO., New York City, recently entertained the Quarter Century club at its Cobleskill, N. Y., operation. Thomas J. Harte, president, was guest speaker at the dinner held at the Hotel Augustan, when gold watches were presented to three members of the 25-year club. Recipients of the watches were Leroy Kennedy, Clifford Allen and Wallace Rivenburg. James Kniswern, assistant purchasing agent, New York, and a member of the Quarter Century club, also spoke.

General Manager

C. A. SARGENT, manager of the Chewelah, Wash., plant of the Northwest Magnesite Company, has been appointed general manager of the company with headquarters in Pittsburgh, Penn. He succeeds EARL GARBER, who has been elected president of the Harbison-Walker Refractories Co., which controls the Northwest Magnesite Company. HOWARD A. ZIEBELL has been made manager of the plant.

Association President

G. T. HARLEY, manager of the Carlsbad, N. M., potash division of the International Minerals and Chemical Corp., Chicago, Ill., has been elected president of the New Mexico Miners and Prospectors Association. JOSEPH H. TAYLOR, vice-president and manager of the Peru Mining Co. at Silver City, was named second vice-president, and JACK C. PIERCE was re-elected secretary-treasurer.

OBITUARIES

EMIL R. GASSER, director of research at the Buffalo, N. Y., plant of Farrel-Birmingham Co., Inc., Ansonia, Conn., died suddenly on September 5 at his home in Buffalo. He was 44 years of age. During World War II, Mr. Gasser was awarded a citation by the Navy Department for his work in development of propulsion gearing.

LOUIS C. BONNOT, vice-president and one of the founders of the Bonnot Company, Louisville, Ohio, died recently. He was 90 years old.

MILTON D. TRITT, retired concrete block manufacturer of Massillon, Ohio, passed away August 7 after a long illness. He was 63 years of age. Mr. Tritt entered the concrete block business with his brothers 33 years ago and retired in 1943 because of illness.

DANIEL B. BUSCH, retired sand and gravel producer of East Rockaway, Long Island, New York, died August 13 at the age of 70. Mr. Busch was one of the founders of Mahoney and Busch, sand and gravel concern, Brooklyn, N. Y., which was later merged with the Colonial Sand and Stone Co., Inc., New York, N. Y.

JOHN AHNFELT, operating manager for all the Universal Portland Cement Company plants, died August 18 at his home in Chicago, Ill., at the age of 76. Mr. Ahnfelt, who came to this country from Sweden as a boy, became a leading figure in the development of portland cement made from blast-furnace slag. He began work in 1895 as a tester in an experimental mill of the old Illinois Steel Company. In 1918, he became operating manager for all Universal plants, with headquarters in Chicago. When the Atlas Portland Cement Co. joined with Universal as a subsidiary of United Steel Corp., Mr. Ahnfelt retained his title until his retirement in 1937.

ERVIN B. STEVENSON, engineer with the Alpha Portland Cement Co., Albany, N. Y., and a former deputy city engineer of Albany, died August 16.

WILLIAM ROBINSON HUEY, general traffic manager at the Chicago office of the Bemis Bro. Bag Co., St. Louis, Mo., died August 22 at his home in Evanston, Ill. He was 69 years old. Mr. Huey joined the company in 1918 at St. Louis and was in charge of traffic there until his appointment as general traffic manager at Chicago in 1934.

NEIL C. HURLEY, chairman of the board of the Independent Pneumatic Tool Co., Aurora, Ill., died August 2 at his home in River Forest, Ill. He was 78 years of age. Mr. Hurley had been president of the company for many years and in 1944 was elected chairman of the board at which time his son, Neil C. Hurley, Jr., succeeded him as president.

HARRY H. BARBER, chairman of the board of the Barber-Greene Co., Aurora, Ill., passed away September 6 after a long illness. He was 70 years old. Mr. Barber, who had retired as president of the company in 1945, was one of the pioneer designers of construction equipment. Among his many inventions were the portable belt conveyor, the self-feeding bucket loader, semi-crawler machine and the full crawler mounted unit, vertical boom, snow loading machine, asphalt traveling mixing plant and finishing machine, portable flight conveyor, portable machines for drying aggregates, gradation control units for separating sand, gravel and other aggregates into desired sizes and automatically measuring out correct quantity of each size for the mixer. In 1940, Mr. Barber was presented the Pioneer Award by the National Association of Manufacturers in connection with observance of the 150th anniversary of the founding of the American Patent System.

NICHOLAS WALTER BENGEL, who had been associated with his brother-in-law, Sidney I. Crew, in the concrete products and building supply business in Cincinnati, Ohio, died suddenly on September 8 at Pomeroy, Ohio, where he had gone to visit a brother. He was 74 years old. In recent years Mr. Bengel had made his home in Orlando, Fla.

WALTER CLINTON BUTLER, treasurer of the Atlantic Gypsum Products Company until his retirement in 1927, passed away September 12 at Orange, N. J. He was 84 years old. Mr. Butler had been general manager of the Calvin Tomkins Co., for 25 years and later was treasurer of the Rock Plaster Co., New York, N. Y.

MRS. FLORENCE F. DYER, treasurer of the Home Builders Supply Co., Memphis, Tenn., died September 9 at the home of her son, Thomas J. Dyer. She was 64 years of age. Mrs. Dyer had started her business career in 1927 after the loss of three members of her family. Her son joined the firm in 1932. Mrs. Dyer continued as active head of the firm until 1942.

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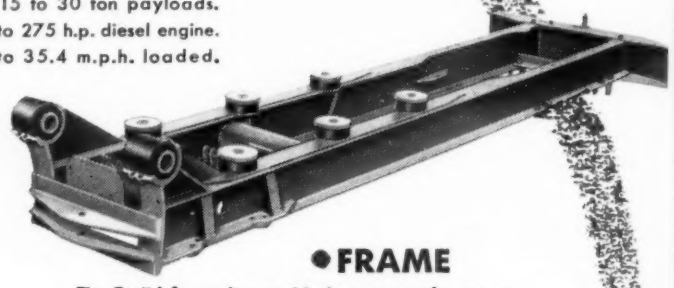

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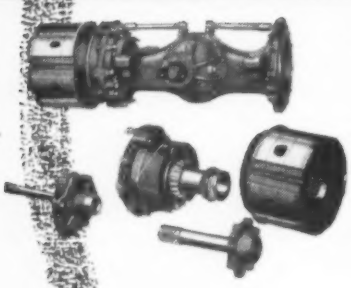

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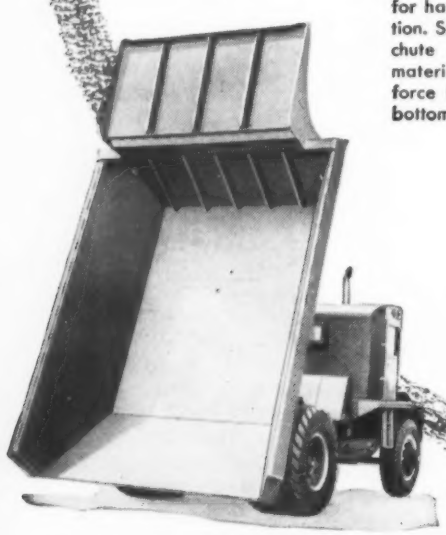

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LABOR RELATIONS TRENDS

Rules Governing Premium Pay Days

By NATHAN C. ROCKWOOD

IN THE DECISION of the U. S. Supreme Court in the Longshoremen's cases (Bay Ridge Operating Co. v. Aron and Huron Stevedoring Corp. v. Blue), it was held that premium wage rates paid for certain hours of work during week days, and for Saturday, Sunday and holidays, could not be used to offset the time-and-one-half rate for overtime in the same work week. This has resulted in a number of changes in collective bargaining contracts, and in new rulings by the Wage and Hour (Fair Labor Standards) Act Administrator. While the high court decision was not as specific as could be wished, the general meaning, as accepted by industry, is that a premium wage paid for work in certain undesirable hours or days, as such, is independent of the premium paid for ordinary overtime, and therefore must be included in computing the overtime rate of one-and-one-half times the "regular rate" in weeks when there is overtime.

Under date of July 29, 1948, and subsequently, the Wage and Hour Administrator, issued copies of letters written in response to specific inquiries giving his interpretation of the Supreme Court decision, the substance of which is as follows: The primary point at issue is whether or not the extra work on Saturdays, Sundays and holidays in the particular instance is a common practice by contract or custom (as would be the case in a 7-day week operation such as required in some of the work at portland cement, lime plants, etc.), or whether work on such days is not customary, desirable or ordinarily necessary. Where such work is not customary, or is out of the ordinary, and the wage rate is time-and-one-half or double-time, as a special premium on that account, it can not be used to offset overtime. The rule need not necessarily apply to the whole working force. For example, a repair and maintenance crew may work overtime fairly regularly on Saturdays, Sundays and holidays at time-and-one-half or double-time without the holiday premium being added in computing the "regular rate." However, if a production force for a special reason is required to work overtime on a holiday and a special premium is paid for this exceptional service because it is for work on a holiday, and these employes work more than 40 hours in the same week, the computation of the "regular rate" for that week must include the premium pay for the holiday. These details could, of course, be covered adequately in the contract, and the opinions given here apply only where the contract is indefinite on this point, and the issue of "pyramiding" overtime pay is raised.

Computing Overtime Rates

The administrator of the F.L.S.A. and of the Public Contracts Act, at present, makes the following interpretation: "It is the position of the Divisions that if such premium payments are contingent upon the fact that an employee has previously worked in excess of a specified number of hours or days in the week, according to a bona fide standard, such premium payments are true overtime payments which need not be included in the computation of regular rate, and may be offset against statutory overtime. In determining whether or not such payments are in fact made for work in excess of such a standard, however, the Divisions will look at both the terms of the applicable contract and the actual practice of the parties under it.

"Here are answers to three examples submitted by an enquirer, in all of which (for the purpose of illustration) the employe's rate is $1 per hour, with time-and-one-half for work on Saturdays as such and also on holidays worked. In this instance the work week commences on Thursday morning and ends Wednesday night, and normally consists of five 8-hour days, excluding Saturday and Sunday. The method of computing the overtime rate, which the Divisions believe to be proper is thus:

"Example A:

"In this case the work week is as follows:

Days	Th.	F.	S.	S.	M.	T.	W.
Hours worked	8	8	8	0	8	8	8
Pay, per agreement	$8	$8	$12	0	$8	$8	$8

"By agreement, the employe receives $52 for the week.

"In as much as the premium compensation paid for Saturday work does not appear from the contract terms to be paid for hours worked in excess of a bona fide daily or weekly standard, since work on that day apparently could not normally fall within the contractural overtime hours, such premium must be regarded as paid for undesirable hours of work and included in the regular rate. Accordingly, the employe's regular rate is determined by dividing the $52 by the 48 hours worked. Overtime for the 8 hours worked in excess of 40 is thus computed at one-and-one-half times such regular rate as follows:

$$\frac{\$52}{48} = \$1.08\tfrac{1}{2} \text{ regular rate}$$

$$\$1.08\tfrac{1}{2} \times \tfrac{1}{2} = \$0.54\text{-}1/6$$

$$\$0.54\text{-}1/6 \times 8 = \$4.33\text{-}1/3$$

"Total compensation due = $52 + $4.33 = $56.33.

"Example B:

"In this case Wednesday is a holiday:

Days	Th.	F.	S.	S.	M.	T.	W.
Hours worked	8	8	8	0	8	8	8
Pay, per agreement	$8	$8	$12	0	$8	$8	$12

"By agreement the employee receives $56.

"The time-and-one-half paid for work on holidays does not appear to be contingent upon the employe's having previously worked a specified number of hours or days within the week. Nor can it be said (in this instance) that holidays, in general, normally fall during the employe's overtime hours. Under these circumstances, it is our opinion, that such time-and-one-half for holiday work constitutes a premium payment, which must be included in the employe's regular rate and may not be offset against statutory overtime under the Act.

"Accordingly, computation of regular rate would be as follows:

$$\frac{\$56}{48} = \$1.16\text{-}2/3$$

$$\$1.16\tfrac{2}{3} \times \tfrac{1}{2} = \$0.58\tfrac{1}{3}$$

$$\$0.58\tfrac{1}{3} \times 8 = \$4.66\tfrac{2}{3}$$

$$\$56 + \$4.66\tfrac{2}{3} = \$60.66\tfrac{2}{3}$$

"Thus the Act requires the payment of at least $60.67.

"Example C:

"In this case Friday rather than Wednesday is a holiday:

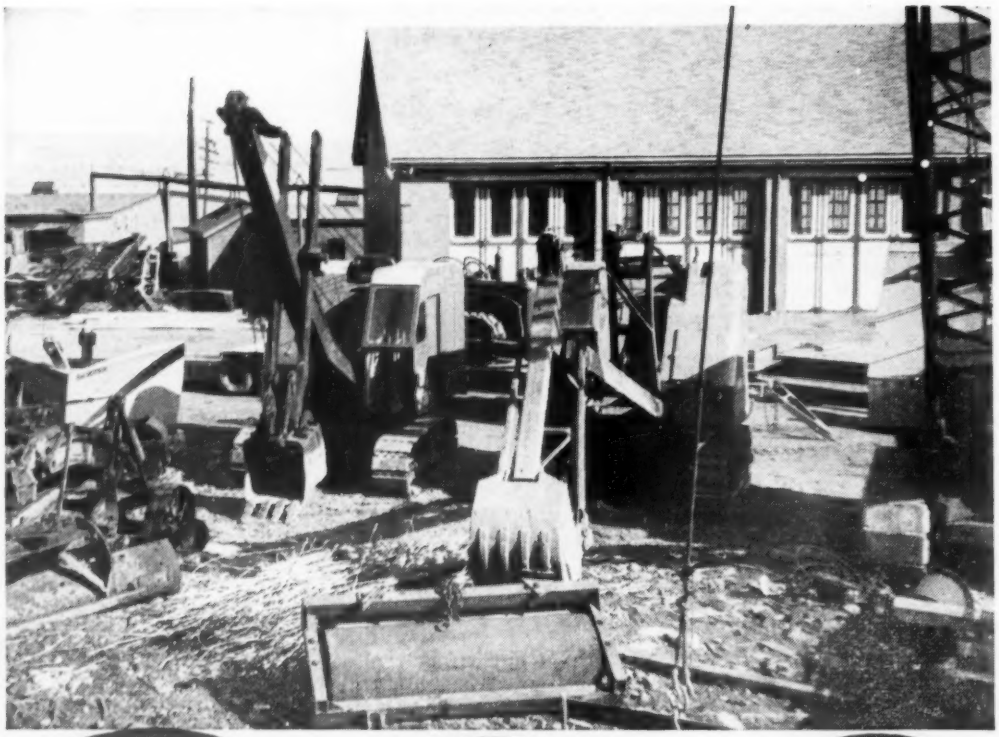
"The computation given in Example B would be equally applicable here, inasmuch as overtime must be computed on the basis of the average hourly rate, and not upon the rate paid during the overtime hours. It is immaterial in this situation where the holiday falls in the work week. Accordingly, $60.67 would be due the employe in this example."

Contract Revisions

To provide against such pyramiding of overtime pay rates some employers are rewriting covering clauses in their collective bargaining contracts in various ways. In some, premium pay for Saturdays as such is being eliminated and premium pay for Sundays reduced to time-and-one-half instead of double-time. In another case a clause providing for double-time for work on holidays is being changed to provide eight hours straight-time pay for holidays not worked plus another eight hours' straight-time pay, when work is performed on holidays. The same contract contains a clause which provides that compensation for holiday time not worked shall not be included in computation of the employe's regular rate of pay for overtime purposes. Other employers are merely adding an "escape" clause which permits renegotiation of the overtime sections of the contract.

In the case of the no-work paid holiday, it is assumed that while the employe who did work would receive his double-time pay, that half of this

(Continued on page 120)



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INDUSTRY News

Perlite Plant in Full-Scale Production

CALIFORNIA Division of Mines reports that a plant for processing perlite for lightweight aggregates has been placed in operation at Campbell, Santa Clara County, by National Perlite Co. During 1947, the plant was used on an experimental basis with limited production. A. G. Keating is president of the perlite company.

New Limestone Deposit

CHEMICAL LIME, INC., is developing a deposit of chemical grade limestone near Baker, Ore., according to Richard N. Spencer, president. Initial development has disclosed nearly 1,000,000 tons of limestone with reasonable possibility of there being several million more tons present in unexplored parts of the deposit. Mr. Spencer also said that from initial sampling it appears that the limestone is 99 percent calcium carbonate.

Fire Damages Gravel Plant

BECKER COUNTY SAND & GRAVEL CO., Detroit Lakes, Minn., was seriously damaged by fire that apparently started in a switch room high in the plant superstructure. John Bentley, superintendent, said the plant would probably be down for 10 days to two weeks. The company has contracts to furnish aggregate for a new sugar beet plant in the area, as well as for rebuilding of highway 81 north of Fargo, N. D.

Agstone Plant Planned

PLANS to establish and operate an agricultural limestone plant near Roseburg, Ore., have been announced by a syndicate headed by C. E. and E. H. Weston. Mineral land leases in the district include the property formerly worked by the Oregon Portland Cement Co., and adjoining acreages. Installations will represent an investment of some $100,000. The plant will have a daily capacity of 350 tons of agricultural and commercial lime.

Chrysotile Quarry

A SOCIETE MINIERE DE L'AMIANTE, a French firm controlled by Eternit of Prouvy-Thiant (Nord) France, has received from the Government of France, a credit of $650,000 to erect a plant at Canari, Corsica, for operating a chrysotile rock quarry. The plant will have a yearly capacity of 5000 to 6000 tons of rather short fiber, said to be suitable for the making of asbestos cement products. It is estimated that the rock will yield about 5 to 6 percent asbestos.

Permanente Buys Plant Site

PERMANENTE CEMENT CO., Oakland, Calif., recently disclosed that it has exercised an option to purchase 498 acres of land near Helena, Montana, as a possible site for a new cement mill. The property has been under option for six months. Western cement demand far exceeds supply at the present time.

Repays Firm in 'Featherbedding'

THE NATIONAL LABOR RELATIONS BOARD recently ordered an AFL plasters union to reimburse a Los Angeles, Calif., construction firm for wages paid to four employes for work they did not perform. It was the board's first ruling under the Taft-Hartley Act bar on "featherbedding" practices by labor unions. The board merely approved terms of an agreement reached on May 27 by representatives of R. H. Parr & Son, the construction company, and the Plasterers and Cement Finishers International Association.

Barge Unloading Facilities

MOUNT CARMEL SAND & GRAVEL CO., Mount Carmel, Ill., recently applied to the U. S. Army Engineer's office at Louisville, Ky., for permission to construct barge unloading facilities at its plant on the Wabash river. The proposed work will consist of three piers and a hoist house.

Operate Limestone Quarry

BATESVILLE WHITE LIME CO., Batesville, Ark., will take over operation of the Reynolds Metals Co. limestone quarry sometime after September 1. The quarry is being operated at present by the Mullinix Limestone Co., Oklahoma City, Okla. With a stipulation that the operator of the quarry will furnish 500,000 tons of chemical limestone each year for 15 years to the Hurricane Creek operation of Reynolds Metals Co. at Bauxite, Ark., the contract has been closed, according to L. R. Myers, operating company president.

Granite Company Suit

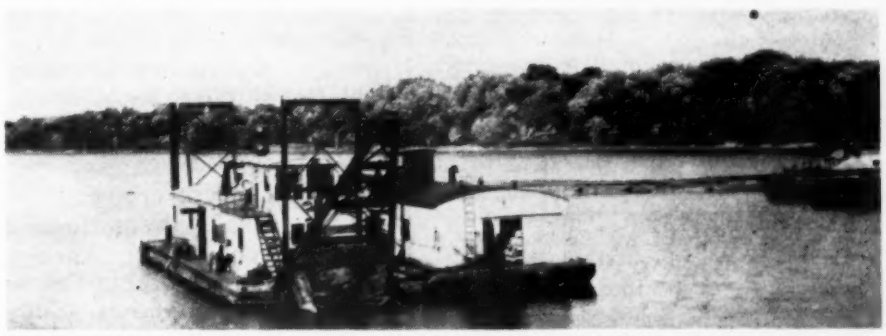
JACOB AND FLORENCE GUENTHER have filed suit against the Miami Granite & Marble Co., Piqua, Ohio, and the City of Piqua for $19,500 and costs, charging negligence in permitting dust and stone particles to be dumped into a storm sewer, killing some one million fish in propagation ponds.

Slate Company Moves

W. E. NEAL SLATE COMPANY has moved from 2524 University Ave. S.E. to 1121 Darmouth, S. E., Minneapolis, Minn., where there is larger warehouse facilities for storage and fabrication of various slate products which the firm distributes.

Ask Dredging Permit

SINA EXCAVATING CO. has applied for permission to carry on dredging operations in Black river, east of Mingo, Mo. The company proposes to dredge sand and gravel and place it ashore for commercial purposes.



Dredge operated by Kershaw Mining Co., Montgomery, Ala., on the Illinois River near Henry, Ill., which produces 2500- to 3000-tons sand and gravel per 8-hr. shift. Power for the operation is produced by a 700 K.V.A. generator which is driven by a Caterpillar Diesel engine. Dredged materials are shipped by barge to Lockport

Plan Alaska Cement Mill

REED SALISBURY, consultant for the RFC and at present on loan to the Alaskan Railroad, has placed a plan for a new cement mill at Windy, Alaska, before the Alaska Development Board, meeting at Anchorage. The plan calls for relocating an existing mill that is now situated on the Sacramento river in California. The project would cost an estimated $800,000 to cover cost of moving the plant, and require $2,500,000 to place it in operation. Plans call for at least half of this capital to come from local sources, so as to keep Alaskan industry "locally owned."

Windy was selected for the new mill's location because of availability of three of the four required raw materials: limestone, coal and slate. Gypsum is the fourth raw material, and it is pointed out that it is the lightest cement ingredient, keeping freight costs low. The new plant, to be located on the Alaska Railroad, can be in operation by May, 1949. Present retail cost of standard portland cement at Anchorage is $2.75 per sack.

Second Longest Conveyor Belt

THE first shipment of conveyor belting for the seven-mile-long transport system which will haul raw materials in building Bull Shoals Dam has been received from Goodyear Tire & Rubber Co. The conveyor system is the second longest ever constructed and will operate cross-country in a series of 21 flights from quarry to dam site on the White River.

Form Gravel Processing Co.

CHARLES MARKHAM, president; Ed Nemeth, vice-president; Art Nemes, secretary-treasurer and George Karkelli, manager, have formed a new corporation to operate a gravel plant near Avon, Ohio. Machinery is in place, and it was expected to start operation of the 60 t.p.h. plant about October 1.

Discover Fuller's Earth

W. R. CASTEEL, Nucla, Colo., has reported discovery of a large deposit of fuller's earth and a large deposit, 100 ft. in thickness, of lime, gypsum and alabaster, in combination, north of Ouray, Colo.

Quarry Location Correction

AN error appeared in the August issue concerning two quarries belonging to Isbell Aglime Co., Russellville, Ala. The quarry that has been leased to E. C. Schroeder Co., Inc., McGregor, Iowa, is located at Isbell, Ala. This quarry is to produce approximately 1,000,000 tons of rip rap to be used in constructing two government dams near Grenada, Miss.

A second quarry, which W. H. Isbell, owner, is interested in leasing as a possible site for a cement plant, is located ¼-mile from the first quarry. This second quarry site contains ample limestone, clay and shale, which according to Mr. Isbell has been analyzed and found well suited for cement milling. Both quarries are located adjacent to tracks of the Southern Railway.

Perlite Company Formed

PERLITE MANUFACTURING CO. OF CARNEGIE, Carnegie, Penn., has been formed to process and distribute perlite, a lightweight aggregate, T. Coleman Ward, Jr., president, announced. Plant capacity is 110 cu. ft. of perlite per hour. The raw material is imported from the Rocky Mountain region, pulverized, and heat-treated.

Coming Conventions

October 14-16, 1948—
American Institute of Mining & Metallurgical Engineers, Industrial Minerals Division, Regional Meeting, Sheraton-Coronado Hotel, St. Louis, Mo.

October 18-22, 1948—
National Safety Congress and Exposition, Stevens Hotel, Chicago, Ill.

October 20, 1948—
American Institute of Mining and Metallurgical Engineers, Industrial Minerals Conference.

October 20-22, 1948—
National Industrial Sand Association, Semi-Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va.

October 22-23, 1948—
American Concrete Pipe Association, Joint Meeting of Executive Committee, Technical Problems Committee, and Committee on Dues, Broadmoor Hotel, Colorado Springs, Colo.

November 4-5, 1948—
California Associated Concrete Pipe Manufacturers, Hotel Mayfair, Los Angeles, Calif.

November 4-6, 1948
Operating Division, National Lime Association, Meeting, Palmer House, Chicago, Ill.

November 5-6, 1948—
Ohio Ceramic Industries Association, Annual Fall Meeting, Deshler-Wallick Hotel, Columbus, Ohio.

December 3-4, 1948—
Missouri Limestone Producers Association, Annual Meeting, Hotel Governor, Jefferson City, Mo.

Jan. 31-Feb. 3, 1949—
National Concrete Masonry Association, 29th Annual Convention and Concrete Industries Exposition, Cleveland Public Auditorium, Cleveland, Ohio.

February 7-9, 1949—
National Crushed Stone Association, 32nd Annual Convention, Hotel New Yorker, New York, N. Y. There will be no exhibit.

February 13-17, 1949—
American Institute of Mining and Metallurgical Engineers, Annual Meeting, San Francisco, Calif.

February 14-18, 1949—
National Ready Mixed Concrete Association, 19th Annual Convention, Hotel New Yorker, New York, N. Y. There will be no exhibit.

February 14-18, 1949—
National Sand and Gravel Association, 33rd Annual Convention, Hotel New Yorker, New York, N. Y. There will be no exhibit.

February 21-22, 1949—
Agricultural Limestone Institute, 4th Annual Convention, Edgewater Beach Hotel, Chicago, Ill.

Feb. 28-March 4, 1949—
American Society for Testing Materials, Spring Meeting and A.S.T.M. Committee Week, Edgewater Beach Hotel, Chicago, Ill.

Operating Division, N.L.A. Plans Meeting

THE OPERATING DIVISION of the National Lime Association will meet November 4-6 at the Palmer House, Chicago, Ill., Robert S. Boynton, general manager of the Association, has announced. According to tentative plans, activities will get underway Thursday at 10:00 a.m. with Lea P. Warner, engineer, Warner Company, speaking on the subject, "How Do You Handle Materials?" Thursday afternoon will be devoted to "Operating Meeting Suggestions and Future Plans" and the Coal Session. Dr. Houston St. Clair, president, Jewell Ridge Coal Corp., is scheduled to speak at the latter using as his topic, "How to Get the Most Out of Coal."

Inspection of Marblehead Lime Company's South Chicago plant will take place Friday morning, followed by a luncheon at Phil Smidt's restaurant. On Friday afternoon, Win. J. Ash, plant manager, New England Lime Co., Canaan, Conn., will lead a questionnaire session on lime plant problems. The concluding session, to be held Saturday morning, will have F. C. Mallery, superintendent, National Gypsum Co., Luckey, Ohio, as speaker, talking on "Packaging Can Be Made Easier."

Pavement Yardage

AWARDS of concrete pavement for the month of August and for the first eight months of 1948 have been announced by the Portland Cement Association as follows:

	Square Yards Awarded During Aug., 1948	During 1st 8 Mos., 1948
Roads	2,073,206	16,888,073
Streets and alleys	1,606,282	13,194,241
Airports	341,238	1,867,961
Totals	4,020,726	31,950,275

Cement Mill Opening

IDEAL CEMENT CO., Denver, Colo., was host during the week of August 16 at its new Portland, Colo. mill to Chamber of Commerce members and guests from nearby Pueblo. Production at the new plant is soon expected to reach a daily figure of 24,000 sacks of cement.

Seek Dredging Permit

NEW HARMONY SAND AND GRAVEL CO., Mt. Carmel, Ill., has applied for a permit to dredge sand and gravel for commercial purposes in the Wabash River.

Synthetic Mica

SYNTHETIC mica crystals, with the electrical and physical characteristics of the natural mineral, have been developed, after many years of research, by the Office of Naval Research, the Army Signal Corps, and the Navy Bureau of Ships. The new synthetic, just announced, is pilot-plant production of fluorine-phlogopite mica crystals, which in addition to having satisfactory electrical and chemical properties, cleave perfectly into thin sheets.

Cement Company Marks 50th Year

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., observed the fiftieth anniversary of its founding this summer with a series of "birthday" parties attended by Marquette employees, their families and invited guests in all communities in which the company's principal plants and offices are located. Entertainment, music, fireworks and refreshments were featured.

Mica Deposits in North Carolina

WARTIME investigations of mica deposits in western North Carolina—a state accounting for approximately half of the nation's mica production—are described in Report of Investigations 4241 issued by the Bureau of Mines, entitled "North Carolina Mica Spots, Mitchell, Macon, Gaston and Yancey Counties." Copies may be obtained free from the Bureau Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Penn.

Talc, Soapstone Production

MINED production of talc, pyrophyllite, and ground soapstone set a new high record in 1947, according to reports by producers to the Bureau of Mines. Some 516,453 short tons were mined last year as against a total of 460,554 short tons mined in 1946. Total value in 1947 was $7,682,481, or nearly a million and a quarter dollars greater than in 1946. Average value per ton rose from $14.10 in 1946 to $14.89 in 1947.

Re-locate Gravel Plant

ART GILES AND DON PIERSON, Humboldt, Iowa, and Harry Zigrang, Livermore, have completed moving their gravel crushing and screening plant to a new pit near Bradgate, Iowa. The new site comprises 200 acres. Formerly the plant was located at St. Joe, Iowa, for two years.

Sand Co. Sold

BARNES SAND AND GRAVEL CO., which operated a sand and gravel business at Sargents, Ohio, since 1907, recently sold properties and plant to The Standard Slag Co., Youngstown, Ohio. The latter company produces various aggregates for road and concrete construction.

Magnesite Production

OUTPUT of crude magnesite in 1947 totalled 375,993 short tons valued at $2,596,747, according to Bureau of Mines, doubling the 1937-39 peacetime average of 166,000 tons. Output in 1946 totalled 324,640 short tons valued at $2,225,850. Refractory magnesia established a new high of 314,-921 short tons valued at $9,466,132 in 1947 as compared with output of 244,824 short tons valued at $7,231,-869 in 1946. Caustic-calcined magnesia decreased 27 percent from 1946 from an output of 45,178 valued at $2,854,538 to 33,049 short tons valued at $2,870,636 last year.

Mine Safety Inspection Law

WYOMING STATE GEOLOGIST, H. D. Thomas of the University of Wyoming, made the announcement recently that general safety recommendations for the metallic and non-metallic mines in the state will be made to the next session of the state legislature. Mr. Thomas and Hugh McLeod, state coal mining inspector, Rock Springs, have just completed a two-week inspection trip covering 22 of the states 23 counties. Their tour of the state was made in compliance with a bill passed by the last state legislature directing them to conduct an inspection of mines not presently covered by state laws and make recommendations for new laws for safe operating procedures. Among types of mines, quarries and tunnels inspected were: limestone, phosphate rock, gypsum, trona, bentonite and vermiculite.

Barges for Dredging Co.

BAUER SMITH DREDGING CO., Port Lavaca, Tex., has placed an order with Dravo Corporation, Pittsburgh, Penn., for the construction of six welded steel 100- x 26-ft. deck barges.

Auction Stone Company

ORRVILLE CAST STONE CO., Orrville, Ohio, was purchased at auction by a group composed of Atty. Myron T. Brenneman, Bernard Snyder, Neil Whitson and Fred Mathias. As yet no plans for use or disposition of the property have been made by the new owners.

New Quarry Location

NICHOLL'S STONE QUARRY, Killbuck, Ohio, is setting up machinery for temporary use in a new location, Perry Gray, superintendent, announced.

Limestone Producers Meet

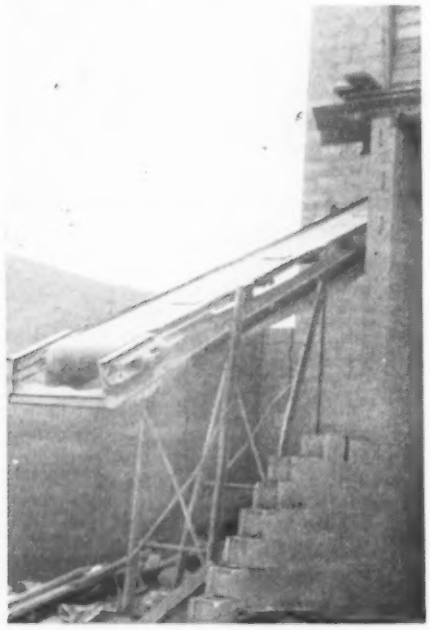
ANNUAL MEETING of the Missouri Limestone Producers Association will be held December 3 and 4 at Governor Hotel, Jefferson City, Mo.

HINTS and HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Inclined Belt Conveyor Handles Bagged Cement

AT A SMALL but efficient concrete products plant in western New York, bagged cement in cloth sacks is used.



Showing stub conveyor for handling sacked cement from trucks into plant

This material is delivered in trucks to the company's plant, and then loaded on to the short stub conveyor that has flat cleats on the belt. The offbearing end of the conveyor is at a convenient height for taking off the bags and stacking them.

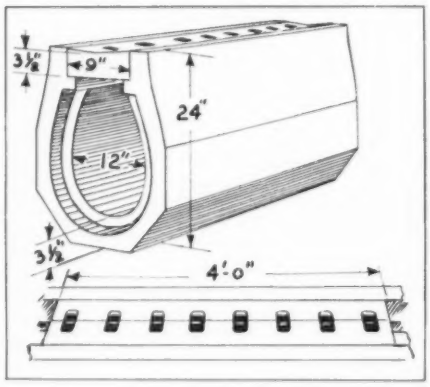
Radio-Telephone System Aids Dredging

SAND AND GRAVEL operations between plant and marine operations of the Warner Co. have been improved with the installation of a radio-telephone system. Easy communication with tugboats and dredges in remote locations is afforded by the system which includes two land stations and seven mobile units. The transmitting stations are so equipped that one mobile unit can talk with another, as well as with the plant. The communication equipment is leased from the Bell Telephone Co. of Pennsylvania.

Precast Concrete Drains for Airports

AT the Parkersburg, W. Va., airport, a new type of box drain set flush with the runway level has been installed. It comprises a series of precast reinforced concrete, two-piece sections, 4-ft. long. As shown in the sketch, the main box section is U-shaped, and 24-in. high with a flat outside bottom and curved inside flow line, having 3-in. sidewalls and tongue-and-groove end joints. In the recess at the top of the U-section is a slotted inlet slab, 3½-in. thick and 9-in. wide, which permits lifting off for inspection and cleaning the drain.

As the drains are placed flush with the ground, they present no obstruction to flight operations. Herman G. Moselowitz, New Brunswick, N. J.,



Cross section and plan details of precast concrete drain tile.

designed the drain which was installed by Meyers-Western Grading Co., for the Civil Aeronautics Administration.

Concrete Culvert For Thickener Overflow

THE VOLUME of water handled by a modern, large capacity phosphate plant in gallons per minute runs into five figures. An idea of the volume of water handled can be obtained by reference to the illustration of a culvert under a roadway at one of the plants in the South which carries the overflow from the 375-ft. thickeners to a 30-acre settling pond.

Smooth Jaws for Crusher

AT a granite crushing operation in the Southeast, a 48- x 60-in. Traylor jaw crusher is being used, the jaws of which are smooth instead of corrugated. According to the superintendent, the reason corrugated jaws are not in use is that they do not nip the stone properly, slowing down production, as compared with smooth jaws. The old corrugated jaws are suspended above the main part of the crusher assembly to take the impact of large falling stone from a fleet

Old corrugated jaws protect top section of crusher from impact of large stone

of rear dump Euclid trucks. The illustration shows the attendant at the primary crusher directing dislodgement of a jammed rock. No shooting is done here.

Culvert carrying thickener overflow

Reinforced Truck Bottom

AT the Southern Aggregates, Inc., plant at Neverson, N. C., operated under lease by Bryan Rock and Sand Co., strippings and granite rock of large size are hauled to the primary crusher by a fleet of seven 18-ton capacity, rear-dump Euclids. As the stone breaks in relatively large pieces, the impact on the bottom of the trucks when loaded by the shovel is considerable.

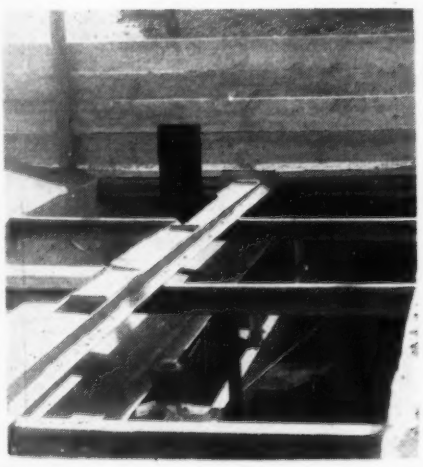
End-dump truck bed reinforced with angle iron sections to absorb impact

To absorb this pounding and abrasion, a series of 2- x 2-in. angle iron sections have been welded to the bottom of the truck bed. The angle iron serves to reinforce the truck bed and at the same time provide a wearing surface that can outlive the truck.

Simple Belt Feeder

A RECLAIMING belt feeder of simple design is employed at the new block plant of Atlas Lime Co., El Paso, Texas. The plant uses scoria or volcanic clinker for making lightweight block. This material is received in gondolas and before stockpiling is crushed to about ½-in. From the crusher the material is elevated to a belt conveyor running in a gallery over the stockpile.

The reclaiming is done by a horizontal belt conveyor that operates under the pile, the material from the pile simply flowing through openings provided over the belt. The conveyor belt runs in a trench walled with concrete and as the stockpile grows this trench is covered with planking. In the illustration a section of the trench not enclosed is shown. The arrow points to one of the several openings provided for feeding the belt. Suitable skirt boards also are provided.



Arrow shows rectangular opening for feeding reclaiming belt from stockpile

Rear Support for Tractor-Lifter

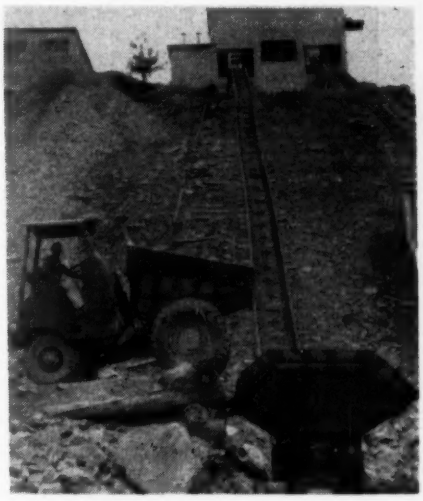
COOK & CO., INC., Portland, Me., employs at its ready mixed concrete plant a tractor with a lift-loader of such design that when a load is raised to the higher positions, its weight rests on the rear of the assembly, tending to tip the front end upwards. To prevent this tipping, a flat roller has been placed at the rear of the tractor, as shown in the illustration. Cook & Co., Inc., supplied much of the ready mixed concrete for bridges and overpasses on the Maine Turnpike.

Flat roller on tractor-lifter prevents front end from tipping upwards

Steel Protector Plate for Ore Car

LIFE of rail-mounted ore cars in operation in New England has been increased with the use of a 1-in. steel plate which protects the car bottoms against rock being dumped into them. Some of the rock is as large as the plant's 30-in. gyratory crusher can handle.

The ore cars, originally of 10 ton capacity, have been built up on the sides so that they can hold 14 tons, or two loads from the quarry haulage units. These truck haulage units, rubber mounted, have capacities of 7 tons each.

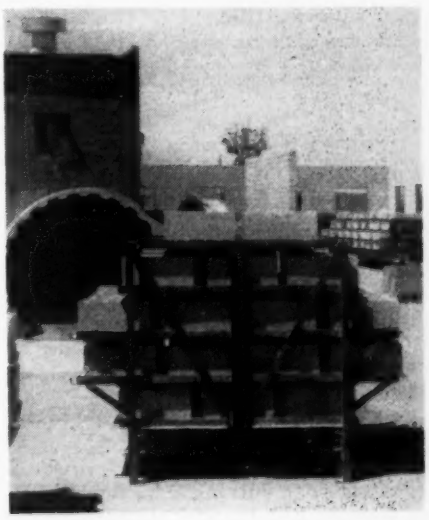


Rubber mounted haulage unit dumps to ore car with built up sides and steel protector plate on bottom

The steel protector plate was decided upon after trying a bed of concrete, 8-in. thick, interlaced with steel rails, and a bed of 3-in. oak planking covered with a ⅝-in. steel plate. The former took up too much capacity and the latter plate proved too thin, operators report.

Block Racks for Cylindrical Kiln

SPECIAL block racks are being employed at Terry Carpenter, Ltd., Scott's Bluff, Neb., for use in the plant's Jackson and Church Co. high pressure steam curing kilns. The kilns are about 80 ft. long, and 6 ft. 6-in. in diameter. Steam pressure is 150 p.s.i. The racks for these cylindrical kilns hold a total of 96 blocks, and 14 racks will fit in each kiln. The Scott's Bluff plant was described in the October, 1947, issue of ROCK PRODUCTS.



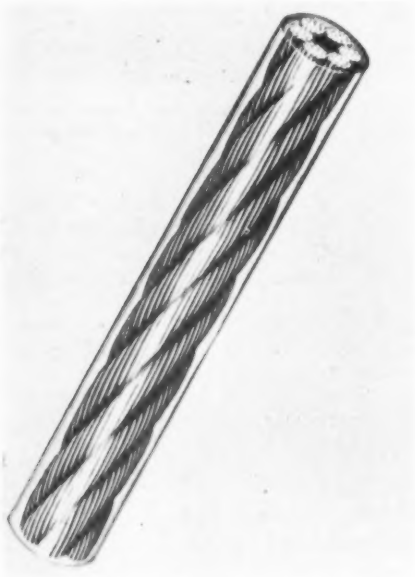
Specially designed rack for cylindrical kiln

new machinery

ROCK PRODUCTS

Nylon Coated Wire Rope

ROCHESTER ROPES, INC., Culpeper, Va., recently started production of Wirelon, a nylon-coated wire rope. This coating makes the rope less susceptable to breaks caused by bending or reversals. This wire rope from 1/32- to 1-in. diameter or greater, coated with Du Pont nylon, is particularly adapted to use with earth moving machinery, according to the manufacturer. Results of tests conducted under A.S.T.M. methods on the nylon coating: water absorption, 1.99 percent; compression ratio, 2.50; specific gravity, 1.125; deformation under load, (122 deg. F.) 8.3 percent at 1000 p.s.i., 22.5 percent at 2000 p.s.i.; tensile strength, 70 deg. F., 13,400 p.s.i., 77 deg. F., 4,930 p.s.i.



Sample of nylon-coated wire rope

Disintegrator

H. E. CULLY, Eugene, Ore. has designed a machine for grinding ore which is believed to have applications in the rock products industries. The Cully Disintegrator, as it is called, consists of a four-armed, rapidly revolving spider that operates within a revolving drum. On the inside of the slower revolving drum are shoes that lift the material and drop it into the spider arms. Grinding is by impact. On the shell of the outside drum, eight small screens are provided so that nothing gets out of the mill until it is ground to the desired fineness. These screens are protected from any unreasonable abrasion wear.

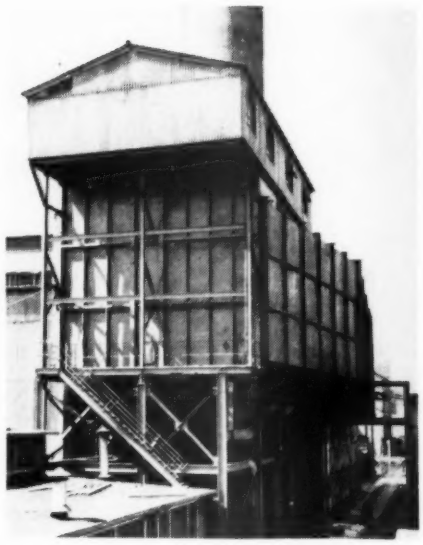
The revolving drum and spider operate from one bearing with the minus ¾-in. feed material being introduced into the machine at a point that would be the normal location of the other outboard bearing; thus the drum and spider overhang.

Normally operating wet, the inventor has built the mill around the idea of having a small, low cost, cheaply maintained grinding unit that can be easily transported to remote mining sections. It could also be used for laboratory grinding purposes.

The mill shown in the illustration weighs about 800 lbs., and has a rated capacity of 5-tons per 24-hours from minus ¾-in. to minus 30-mesh. The interior spider operates in the 800 r.p.m. range with the outer drum running much slower. It requires a ⅔-hp. gasoline engine to operate it through "V" belt drives. The inventor claims that through the nature of the grinding, the original shape of the mineral content is retained to a higher degree than with most grinding units, thus making the mineral more easily recovered by gravimetric means.

Electrical Precipitator for Dust Removal

KOPPERS CO., INC., Pittsburgh, Penn., is manufacturing the Koppers-Elex electrostatic precipitator under license from the Swiss firm Elex S.A. The precipitators are made in six types to meet specific requirements.



Precipitator dust collector in Eastern cement plant recovers dusts from kilns

Of particular interest to the rock products industry is the type developed for precipitation and recovery of dry dusts from gases arising from kilns, kettles, mixers, dryers, conveyors, and grinding mills. As an example of the efficiency of this type of dust collector, the manufacturer cites the experience of an East Coast gypsum producer in recovery of gypsum dust from calcining kettles: with a volume of gas, amounting to 4500

H. E. Cully (smoking pipe) demonstrates his disintegrator to a miner

c.f.m. for each of four kettles, tests on four precipitators showed from 98.7 to 99.8 percent efficiency, whereas 97 percent efficiency was guaranteed.

The Koppers-Elex precipitators for solid particle removal are designed for periodic rapping to discharge the dust from the collecting electrodes in a single gas lane at a time, with the dust required to fall a maximum of 26-in. before passing out of the gas stream. This reduces to a minimum the re-entrainment. Rapping is actuated by clock-timer controls. The electrical power units for the precipitators are of two types; one known as the "Elex-Pak," and the other as the "Vac-Pak," for which no special substation is required. These are packaged power units for production of unidirectional high voltage current.

Wire Insulation Improves in Water

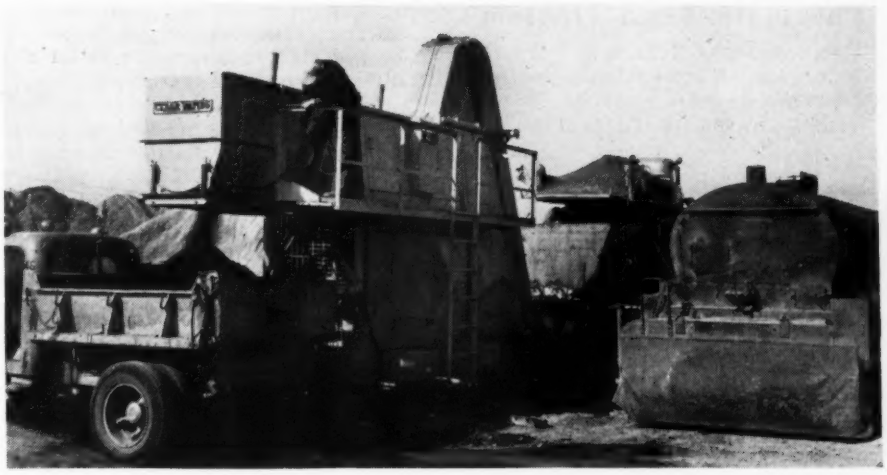
UNITED STATES RUBBER COMPANY, New York, N. Y., has developed a new electrical wire with natural rubber insulation that improves when soaked in water. The wire is designed for use underground and in wet locations where high moisture resistance gives it longer life and increased safety. Tests show that where the wire was immersed in water at a high temperature for 24 weeks, the insulation resistance curve rose from 500 megohms to 2400 megohms per 1000 ft. of wire. Normal insulation resistance curves show a sharp drop after two to four weeks immersion. The wire is being marketed under the trade name "Laytex RUW."

Bituminous Mixing Plant

IOWA MANUFACTURING CO., Cedar Rapids, Iowa, has brought out a portable continuous volumetric-type bituminous mixing plant called the Master mixer with a capacity of 100 to 150 t.p.h. The plants are built in two units on pneumatic tired steel trucks.

The mixing unit consists of a large single shaft pug mill with removable paddles adjustable to vary the mixing action, a fully enclosed hot elevator collapsible for transporting and a bitumen metering pump with adjustable volume control. All operating controls are easily accessible from the operator's platform. This unit can be set up quickly with front wheels removed to provide a truck driveway under the pug mill gate.

The gradation unit screens the aggregate into various sizes, and provides a steady flow of accurately proportioned aggregates to the mixing unit. Included in this unit is Cedarapids-Symons double-deck horizontal vibrating screen, a hot elevator, a three-compartment bin with overflow chutes, and an apron feeder with adjustable controls. Although the Master mixer two-unit set-up may be used for all jobs, where specifications are not as complex, such as base course mixes, the mixing unit may be used alone.

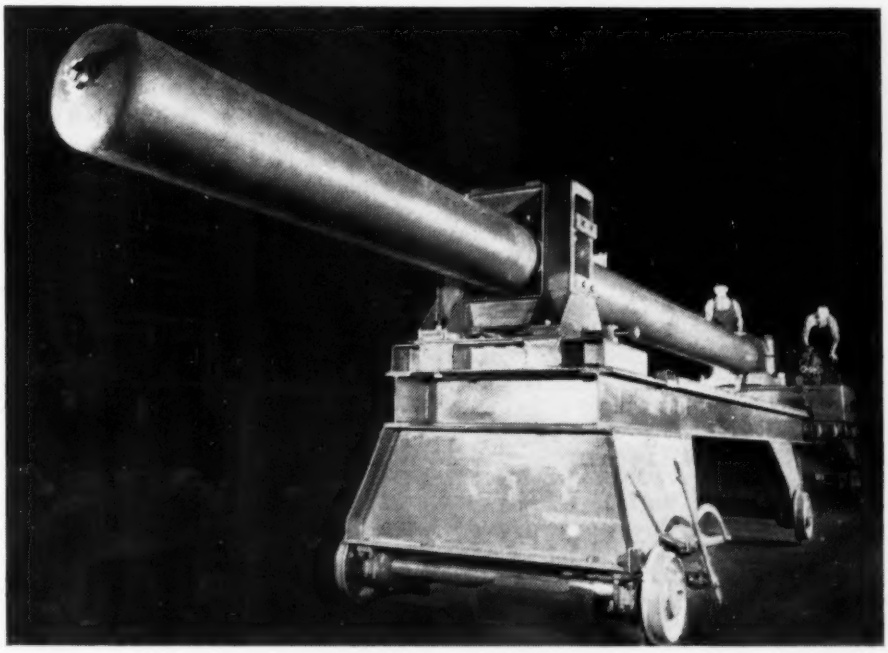


Portable volumetric-type bituminous mixing plant

Boring Bar to Remove Kiln Rings

ONE of the major problems in kiln operation is the loss of production caused by rings building up on the lining of kilns. An effective method of removing these rings without loss of production is the use of a boring bar. The 40-ft. bar, shown in the illustrations, mounted on a motor driven carriage in the shops of Allis-Chalmers Mfg. Co., Milwaukee, Wis., consists of a large water-cooled tube to the end of which is bolted a cutting edge. The bar is slowly inserted into the rotating kiln, removing the fused materials adhering to the lining. This 20-in. diameter bar is destined for a large manufacturer of industrial chemicals.

End view of boring bar for removal of kiln "rings." This 20-in. diameter boring bar is installed on a motor-driven carriage



Side view showing how boring bar, 40-ft. long, is mounted on motor-driven carriage with flanged wheels for operation over track

Pneumatic-Tired Tractors

MINNEAPOLIS-MOLINE POWER IMPLEMENT CO., Minneapolis, Minn., has developed two industrial tractors mounted on pneumatic tires that are

Tractor equipped with 4-cylinder, 27-hp. gasoline engine

adaptable to various applications in the rock products industries. They have been equipped with shovel loader, bulldozer, scraper excavators, etc. Model RTI is equipped with a 4-cylinder, 27-hp. gasoline engine, Model EE. It has 4 forward speeds of 2.4, 3.5, 4.5, and 12.6 m.p.h., and one reverse speed.

The Model UTIL has six forward speeds, ranging from 1.8 to 14.5 m.p.h., and a "shuttle gear" for reversing at 85 percent of forward speeds, making possible quick changes from forward to reverse. This tractor has an oversize front-end with a tire capacity of 10,000 lbs. Heavy cast front wheels are inset over steering knuckle pins to eliminate road shock and permit the steering wheel to roll easily under capacity front-end loads.

Swivel Loader

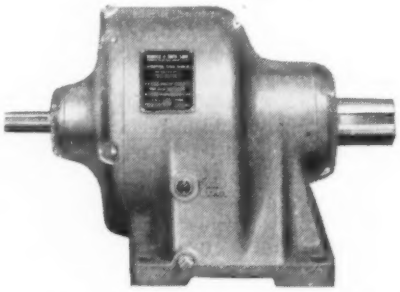
STEPHENS-ADAMSON MANUFACTURING CO., Aurora, Ill., has introduced what has been termed a Swiveloader for loading railroad freight cars or it may be attached at the end of portable conveyor to extend stockpiling range. This equipment is an adaptation of a similar loader made by this company and mounted on a cart which has been used to load cars. The new loader may be used to load material not over 2-in. lump size.

This loader includes a pivoted feed chute, thrower unit on swivel mount, motor, starting switch, and pivot brackets. The "thrower" consists of a short, high-speed conveyor belt operating on two pulleys. The upper belt surface is held in a concave curve by two discs, one operating on each edge of the belt. A vertical feed spout drops the material onto the curved belt between discs. In travelling the few inches around the curved path, the material is forced against the belt by centrifugal action, and attains the high speed of the belt and is thrown 25 to 35 ft. An operating lever, in easy reach, permits the trajectory of material to be raised or lowered. The thrower unit can also be swiveled to direct the material to different parts of the car.

When it is attached to the end of a portable conveyor, the pivoted chute is replaced by a short, wide-mouthed spout, and the swivel mount is guided by a cable from the ground.

Speed Reducer

WINFIELD H. SMITH CORPORATION, Springville, N. Y., has developed its Winsmith patented, helical gear differential speed reducer. This compact speed reducer has the advantages of direct centered load distribution, a rigid and vibrationless mounting, a larger area for heat radiation, and increased quietness of operation. It is said that this design permits increased overhung load capacities. The gears of this reducer are made integral and combined in a planetary frame to form a complete unified planetary element. Ratios from 5 to 1 to as much as 50,000 to 1 can be provided

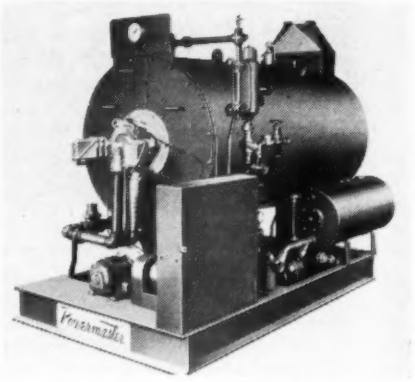


Speed reducer features increased overhang load capacities

with no increase in the number of parts. Horsepower ranges from .62 to 81.5. They are made in horizontal, vertical and flange-mounted types.

Steam Generator

ORR & SEMBOWER, INC., Reading, Penn., is now in production on a steam-generating unit with a three-way fuel burner to permit use of heavy oil, light oil, or gas firing. Only 10-min. or less are required for fuel changeover, states the manufacturer,



Automatic steam generator fired with three-way oil burner

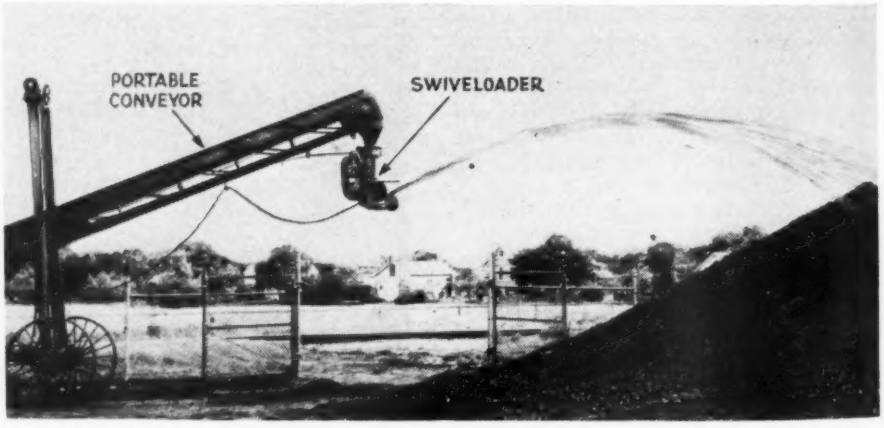
and full steam pressure is attained within 18-min.

The Powermaster, as it is called, ranges from 15- to 200-hp., and is fully automatic. It has modulated control of flame-volume to maintain constant steam pressure as steam demand varies. Safety features include an electronic fire-eye, for oil; and a flame rod, for gas, to automatically shut off the boiler in case of flame failure.

Arc-welding Electrodes

GENERAL ELECTRIC CO., Schenectady, N. Y., has announced the development of four electrodes for use in a wide range of arc-welding operations, designated Types W-60, W-61, W-62, and W-95.

Type W-60 was designed to meet the need for an electrode with a low-hydrogen coating, manganese-moly analysis, and good usability characteristics, suitable for welding most hardenable steels. Type W-61 is a low-hydrogen electrode of a moly-vanadium composition that can be used with either a.c. or reverse polarity d.c. to weld a wide variety of low-alloy steels, and is said to be especially suited for welding low-alloy pipe. Type W-62, a low-hydrogen, titania-coated electrode of 2½ percent nickel composition, can be used on steel castings of a similar analysis and for producing weld deposits having

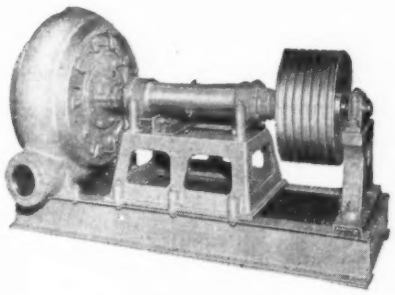


Swinging loader attached to portable conveyor

high impact properties at sub-zero temperatures. Type W-95, designed to deposit extremely hard wear-resisting weld metal in all positions, using a.c. or d.c. is suitable for surfacing dipper teeth, dragline bucket lips, tractor cleats, impeller crane hooks, sand pumps, and sizing screens.

Sand and Gravel Pump

THE KANSAS CITY HAY PRESS CO., Kansas City, Mo., has designed a pump for handling sand and gravel pulp, called the Lightning, which is



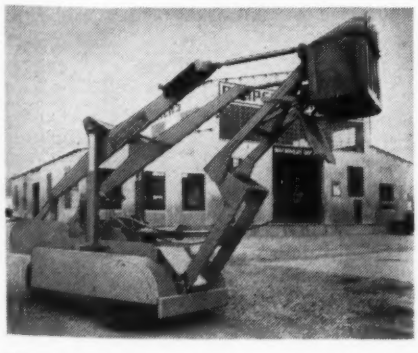
Pump for handling sand and gravel pulp gives maximum abrasion resistance

said to give maximum abrasion resistance and ease in maintenance.

By securing front and back side plates without bolts disassembly and parts replacement has been made relatively easy. Absence of bolt holes in the shell tend to strengthen and lengthen the service life. The design makes possible the close tolerance of 1/64th in. between impeller and suction liner, largely eliminating entrance of abrasive materials. All wearing parts of the pump are cast of an alloy called Hi-Chro-Hi, a white, semi-steel. Pumps come in 6, 8, and 10-in. impeller sizes.

Hydraulic Shovel Loader

DEMPSTER BROS., Knoxville, Tenn., has announced its Dempster-Diggster, which is essentially a small shovel mounted on a three-wheel, pneumatic-tired chassis. It operates on a hydraulic crowd and hoist principle, and no digging is done with the aid of the wheels. The shovel can dig 15-in. under the grade or 15-ft. above the grade. It is equipped with a 95-hp., 6-cylinder engine, and the unit can be driven at truck speeds on the highway, according to the manufacturer. Dual steering wheels add stability and give the unit a 10-ft. 6-in. turning radius.



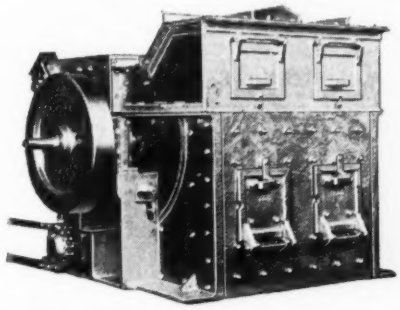
Pneumatic-tired shovel with ¾-cu. yd. bucket

Improved Hammermill

DIXIE MACHINERY MFG. CO., St. Louis, Mo., has announced an improved "36 series" hammermill with a longer, continuously moving breaker plate that guards against the passage of oversized materials between the breaker plate and the front cage bar. It is claimed that the extension of the moving breaker plate results in improved grinding control for unvarying uniformity of product, particularly in the reduction of wet, sticky material. As an added precaution against restricting the flow of material, more space also has been provided between the cage bars and the back of the mill.

Other important changes include: all-steel construction; flange type end discs of cast steel to protect hammer bolts and nuts from wear; and easy access to hammers for periodic examination by conveniently located clean-out and inspection door.

Four sizes of the mill, all of which are equipped with the continuously



Hammermill equipped with a long, continuously moving breaker plate

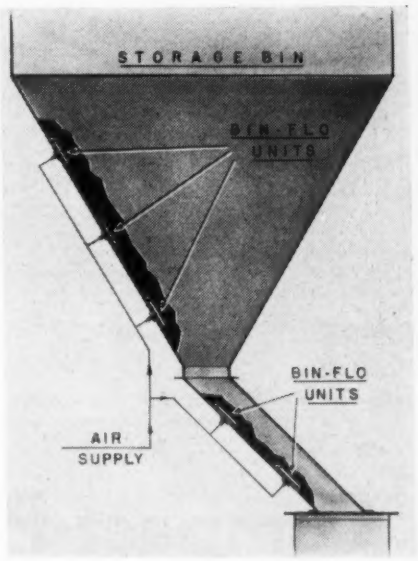
moving breaker plate, are designed for either primary or secondary crushing, and range in capacities from 25 to 150 tons.

Pinch Valve Control

FARRIS ENGINEERING CORP., Palisades Park, N. J., announces a new series of automatic controls for use with a new type of pinch valve, the Springless Dual Drive. This is the first time such a fundamental theory of valve controls has been offered in both hand operated and automatic types, including relief valves, according to the manufacturer.

Bin Aerating Device

THE BIN-DICATOR CO., Detroit, Mich., has brought out an aerating device, called Bin-Flo, to provide uniform and steady flow of bulk materials from bins, hoppers, and chutes. This unit is a small plate 3¾ x 7½ x 1½-in. thick which is located at points where



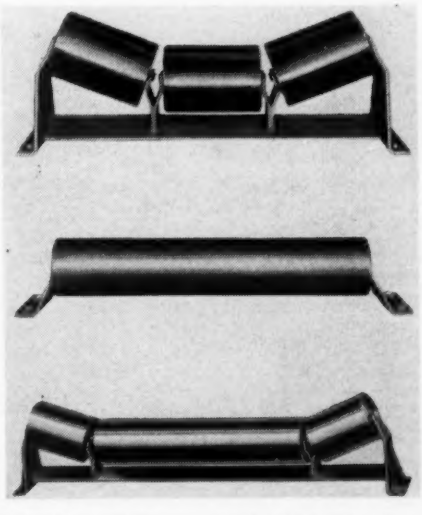
Aerating device provides uniform flow of materials

flow is restricted. Low-pressure air is injected into the material through a special fabric diffuser, causing the material to flow freely. It is claimed that these units will not plug up even with the most finely ground material and are applicable to most dry, finely ground products.

This unit can be used in conjunction with Bin-Dicators or they can be installed independently. Models are provided for thin-walled bins and chutes and for concrete and other thick-walled hoppers. Piping can be run either outside of thin-walled bins or inside of a thick-walled bin.

Belt Idler

PALMER BEE CO., Detroit, Mich., has designed a belt idler which is said to be easily removable by hand and is interchangeable. Another feature of this idler is the "lubricated for life" ball bearings with which they are equipped. No further greasing is required, according to the manufacturer.



Belt idler with life-time lubricated ball bearings

Sand Classification

By W. B. LENHART

Panoramic view of plant with long conveyor, to the left, inclining up to ready mixed concrete plant; clam shell mounted on gantry crane in left background; screening, crushing, and classifier plant in the center; and to the right is the long radial stacker

Compact Plant Produces Many Sizes

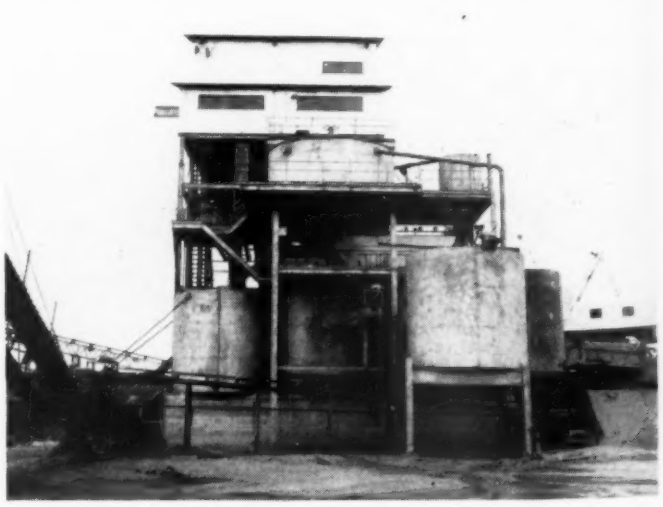
VISITORS to the new sand and gravel plant of the Pacific Building Materials Co., Portland, Ore., have acclaimed it to be a model of efficiency, flexibility and neatness. In addition to an unusual sand classification system, the plant has many other interesting innovations among which might be mentioned the method of removing water-logged wood chips from gravel and the extreme flexibility of the conveying system. As one visitor put it, "You will see a lot of plant in a relatively small space," and that is very true. For in this five-storied, all steel (except wood floors) plant, both crushed and uncrushed, washed gravel is prepared, and kept separate; and three sizes of sand are processed although the equipment can supply eight sizes of sand if necessary.

Plant facilities include a blending system with belt conveyors, radial stockpilers, shuttle belt loading at the dock, a new ready mixed concrete plant, unique gantry crane for unloading gravel to the plant, and other features. All this is in a relatively small space, yet the plant or yard does not have the impression of crowding—plenty of room for everything.

Built by the company, the plant was designed under the direction of Frank Penepacker, vice-president of the company, who with Carl Kubitz, superintendent; Rex Childs, master mechanic; Howard Hamlin, foreman; Charles Setvin, ready mixed concrete foreman, and others, provided the general layout, and Alex Stovanov, industrial engineer of Portland, made the detailed drawings. Only six men are required to operate the plant. Located near the west end of the Ross Island bridge and on the west bank of the Willamette river, these new plants (ready mixed concrete and sand and gravel) replace older units near the same site which have been completely torn down and removed. The company has another older sand and gravel plant nearer downtown Portland and also a ready mixed concrete plant at the same site. At Vancouver, Wash., a new ready mixed concrete plant has been completed that features Noble batching equipment. This plant also replaces an older unit. General offices of the Pacific Building Materials Co. are in Portland, Ore. The ready mixed concrete business is conducted under the name of the Readymix Concrete Co.

Dredging Operation

All sand and gravel for the company's manifold operations is dredged from the Willamette river. The company has two floating clam shell diggers in operation, both steam driven. One uses a 2½-cu. yd. round nose Blaw Knox bucket and the other a 2-cu. yd. Owens clam shell. These buckets are handled by two hoists;



Left: Showing compact arrangement for equipment and storage bins; tank to the left is for "muck" sand. Right: Hydroseparator is on upper level in foreground with constant head tank, to the right, for hydrosizer on the next lower level

Pacific Building Materials Co., Portland, Ore., dredges all material from Willamette River. Plant designed to prepare both crushed and uncrushed gravel, and eight sizes of sand, if necessary. Also operates ready mixed concrete plant, and building supply warehouses

Gantry crane with clam shell bucket dominates the busy water front

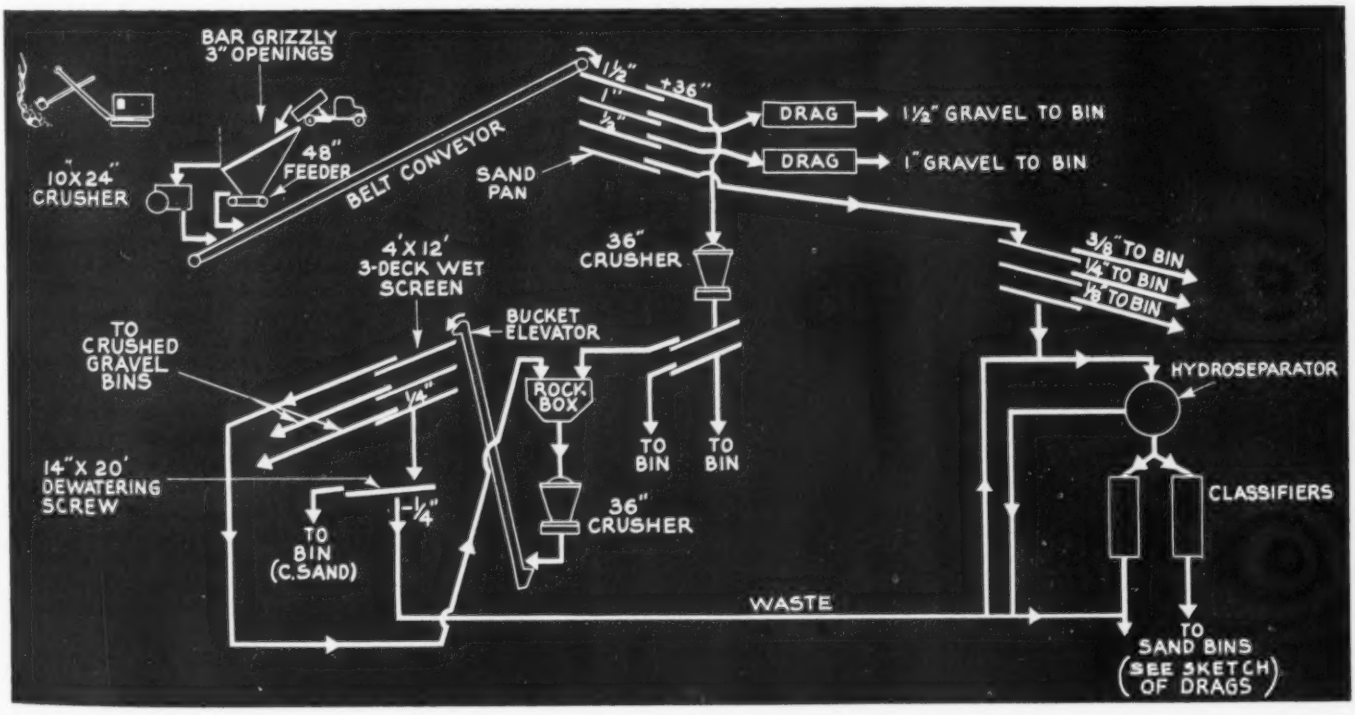
an 11- x 13-in. American and an 11- x 12-in. Mundy hoist. All plants of the company are supplied around 2000 cu. yd. of material per day by this dredging operation. All river transportation is under contract with 16 company-owned wooden barges in service. One is 40- x 140-ft. and the others are 38- x 130-ft., all being 10-ft. 6-in. to 11-ft. 6-in. in depth.

Contractor's tow boats deliver the barges to the plant where they are unloaded by a new American Hoist and Derrick Co. gantry crane with a 4-cu. yd. Owens clam shell bucket. The gantry crane is erected on concrete footings at the edge of the river and well out in the water. On these footings heavy steel columns support the crane which has a 360-deg. swing in either direction. The boom is 115-ft. long, and as the main body of the crane is mounted about 40 ft. above the water line, the lift is about 70-ft. above water line. The operator's cab, which is about 60-ft. above water line, is glassed in on three sides with the General Electric controls arranged conveniently so that the operator has an uninterrupted vision on all three sides. Operation of the crane is by means of a 3-drum hoist powered by a 150-hp. G.E. motor, in conjunction with a G.E. Pyradl capacitator rack. The front drum of the hoist holds the trip or holding line, and uses 1⅛-in. cable. The middle drum, holding the closing line, also has 1⅛-in. cable. The back drum operates the boom and carries a ⅞-in. line.

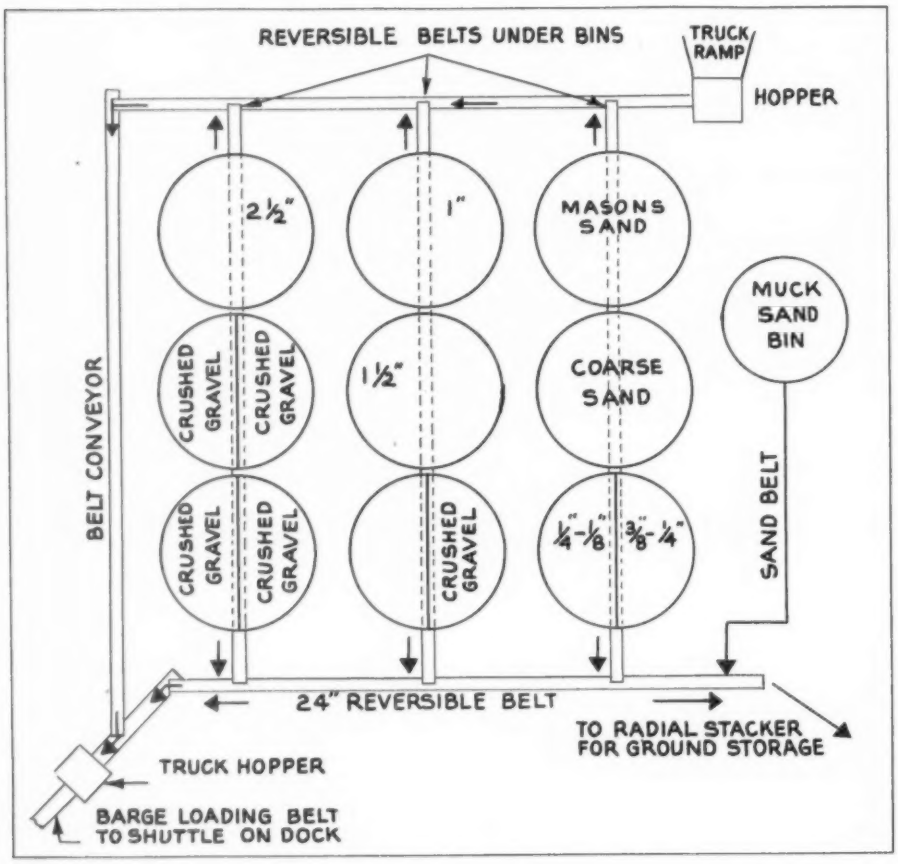
Travel controls have been taken off the gantry and the mechanism revamped so that it is now used to move the barges up-stream or down into unloading position. The 4-cu. yd. Owens bucket weighs empty 12,210 lb. Good hoist brake bands are essential as the rate of travel of the 1⅛-in. lines is 200 f.p.m., the lift is 70-ft. and net and gross weights handled are substantial. Ralph E. Hamilton, crane operator, says he prefers the No. 900 Johns-Mansville brake bands for they stand up under this severe service. The weight of the bucket and its speed of drop causes heating that soon destroys inferior brake bands.

Rapid Unloading of Barges

The unloading cycle varies; to top-off a load the bucket takes a 4-yd. bite about every 45 seconds. The gravel below is then cleaned up and here the swing is about every 55 to 60 seconds with the over-all average being 55 seconds. On this basis the gantry can handle 250 cu. yd. per hr.



Flowsheet of sand and gravel screening, crushing, and classifying plant. Details of storage facilities and sand sizer operation shown on other drawings



Arrangement of plant storage bins with reclaiming conveyor system

without crowding; ample for the plant's capacity which is rated at 150-yds. per hr. As the speed of the crane is in excess of requirements, it uses its spare time to load river run gravel to a truck loading hopper alongside the unit. Two new steel silos, located near the toe of the gantry, were being placed in service at the time of inspection. Concrete and mason's sand, instead of being all ground stored, is re-loaded onto barges and the gantry re-handles this material to the two new truck loading silos. The steel silos hold about 200 cu. yd. each. The general location of the gantry is on the up-stream edge of the plant and at a point that the high-mounted, primary grizzly can be served when the boom is at a 45-deg. angle. Originally the steel boom came with a 95-ft. length but a 20-ft. section was welded about midway in the boom assembly.

The swing motor on the crane is a 40-hp. G.E. unit. Air for the air brakes is supplied by a small, vertical compressor driven by a Delco motor with Square D pressure switches. All the controls for the larger motors are G.E.

Crushing, Washing, and Screening

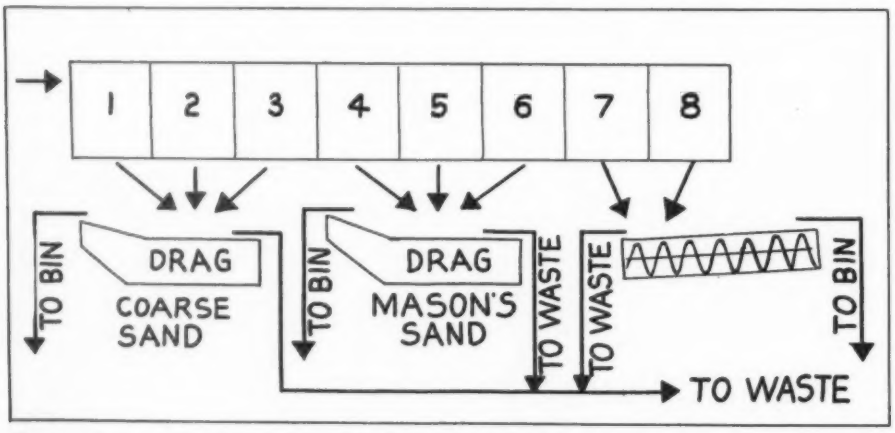
The clam shell unloads to a V-bar grizzly located 60-ft. above low water level. It is of irregular shape but roughly 10- x 10-ft. with 3-in. openings, and it is supported at a 25 deg. angle in a steel receiving hopper that has flared sides providing a dump opening about 16-ft. square. The main structure of the plant itself is 75-ft. high. Oversize from the grizzly falls to a 10- x 24-in. Austin Western jaw crusher just below the grizzly.

This rather novel arrangement permits the use of a shorter main inclined belt to serve the plant. Vibration due to the crusher being mounted in this high structure is surprisingly small. The crusher discharges to a belt under a 3- x 10-ft. Lippman pan feeder which also receives the fines through the grizzly. The pan is driven through a Reeves variable speed control unit. The feeder delivers material to a "bob-tailed," 36-in. belt conveyor which in turn discharges to a 3-deck, Seco scalping screen. This wet-operated screen is 4- x 12-ft. with 1½-in., 1-in. and ½-in. wire mesh, respectively. Later this screen may be made into a 4-deck unit with a 2½-in. mesh top deck. This screen is located near the top of the plant, and all other units that follow are fed by gravity with one exception where a small bucket elevator is used in the crushed gravel section.

The scalper screen has two parallel banks of water sprays. One bank of six outlets is near the upper end, and just below mid-section is another header with five sprays. The sprays throw a very liberal amount of water.

Oversize from the top deck of the Seco scalper is the nominal source of all the crushed gravel produced, but gravel from the second deck can also be crushed if desired. Gravel from the top decks falls to a 36-in. Telsmith gyratory crusher mounted just below the Seco screen. It is driven by a 75-h.p. G.E. motor through seven strands of Vulco "V" belts. The crushed rock falls to a 3- x 8-ft. Stephens-Adamson, 2-deck, dry, vibrating screen mounted close to the ceiling line under the crusher. Throughs from both decks are spouted to steel cylindrical silos below. The screen size here varies to meet conditions. Oversize from the top deck of the Stephens-Adamson screen falls to a rock box and from thence to another 36-in. Telsmith crusher mounted near the ground line. This crusher, which is driven by a 75-hp. Westinghouse motor through "V" belt drives, is provided with a Bowser, "Teleflo" oil indicator. The crusher discharges to a Link-Belt bucket elevator that has 7- x 18-in. MS AA style buckets. It is driven by a 20-hp. Fairbanks-Morse motor through gear reducer and roller chain.

The bucket elevator discharges to a 3-deck, wet, 4- x 12- ft. Pioneer screen. The lower deck has ¼-in. mesh, and the two upper decks have screen cloth



Showing how compartments of sand hydrosizer are distributed to dewatering drags and screw before discharging to bins

that is changed to meet conditions. The oversize from the top deck falls back to the previously mentioned rock box for re-crushing. Plus material on the two lower decks drops to bins below. The minus ¼-in. materials flow to a 14-in. x 20-ft. Stephens-Adamson de-watering screw with the crushed gravel sands falling to bins below. It is locally referred to as a ¼-in. crushed paving rock. Overflow from the screw goes to a Dorr hydro separator. It will thus be seen that the crushed gravel section can make at one set-up a total of four sizes of crushed gravel and one of crushed sand.

Removing Water-Logged Wood Chips

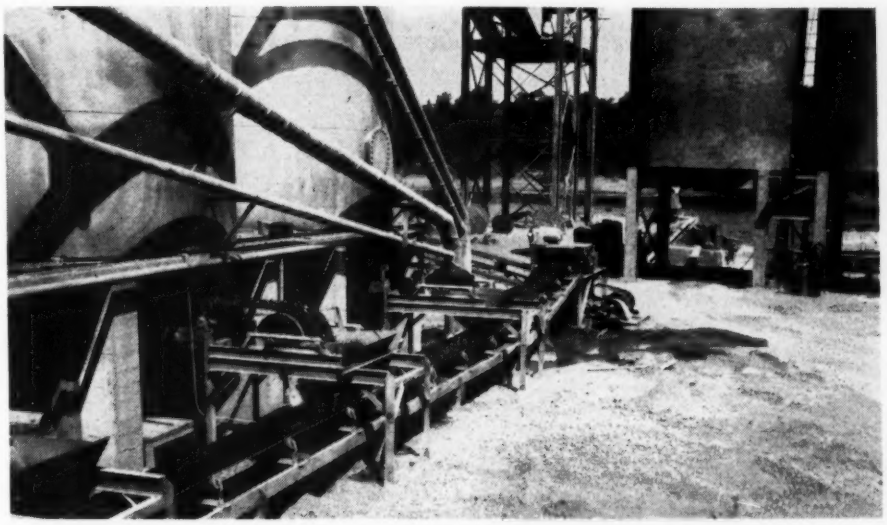
Returning to the Seco scalper screen; the minus 1½-in., plus 1-in. that goes through the top deck falls to a 36-in. drag that removes water-logged wood chips from the material. In a similar manner the minus 1-in., plus ½-in. gravel from the top of the lower deck falls to a similar drag. These two units resemble in practically every detail an ordinary sand drag. Here the washed gravel enters the machine just below where the blades emerge from the settling pool. Turbulence in this pool is sufficient to lift up and carry to the outlet any wood chips that might be entrained in the aggregate. The drags, 36-in. wide and about 20-ft. long, were made by the Washington Machinery and Storage Co. of Seattle. Each are driven by a 5-hp. Sterling direct power applicator. No sprays are used on the gravel as it goes up the inclined section of the drags to the respective bins. The machines work smoothly on the gravel, and the amount of wear on the blades will be low from present indications. It has proven a novel, simple, and ingenious method of solving what often has proven to be a vexing problem.

Minus ½-in. material that passes through the lower deck of the Seco scalper splits and goes to two, 3-deck, wet, 3- x 8-ft. Simplicity vibrating screens that operate in parallel. The screen meshes are ⅜-in., ¼-in., and ⅛-in. respectively. All top deck materials from these two screens fall to bins below. The minus materials flow to a 20-ft. dia. x 8-ft. AX Dorr hydroseparator.

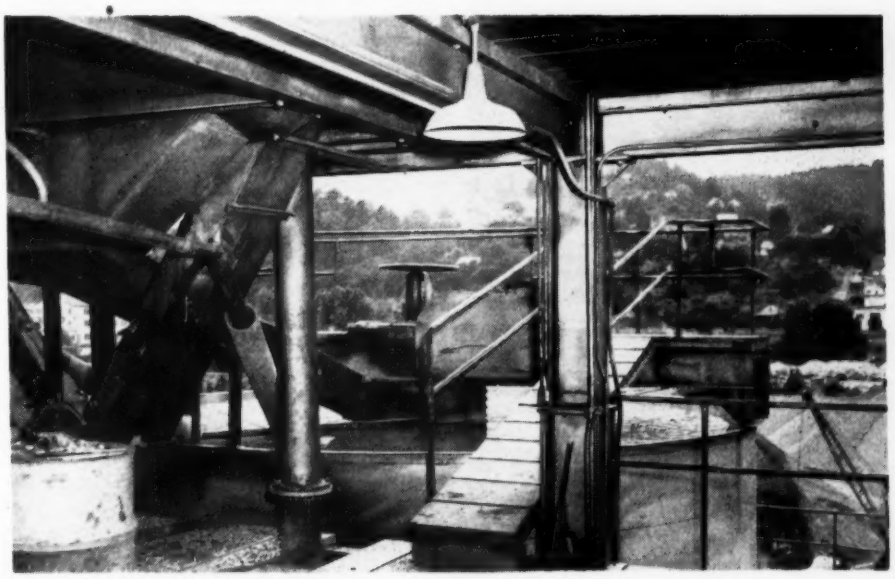
Hydroseparator and Sizers Recover Fines

Designers of this portion of the plant estimated that there would be 80 to 100 tons of sand per hour, plus 300 tons of water per hour (or about 1200 g.p.m.) going to the hydroseparator. The overflow would be all minus 150-mesh (mostly slimes) with 201 tons of water per hour over-flowing. The underflow would be 50 percent solids.

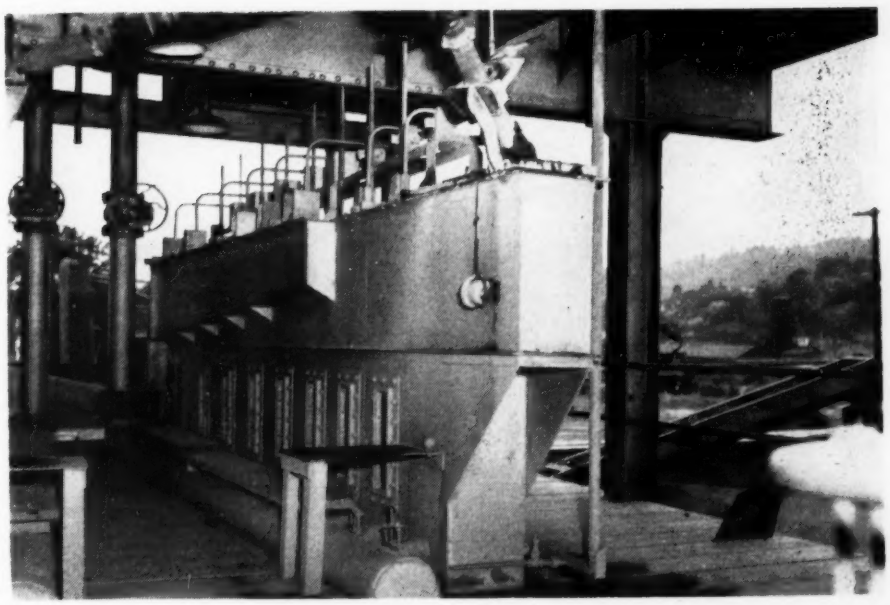
The underflow splits and goes in series to two, EX-8 Dorrco sand



Reversible conveyor belts under bins are delivering aggregate to the main belt conveyor serving ready-mixed concrete plant



Hydroseparator mounted at an elevation close to the main plant



One of two hydrosizers for sand classification

Left: Driving mechanism for A-frame of radial stacker. Right: Radial stacker for stockpiling different sizes.

Rex Childs, master mechanic, demonstrates how the shuttle loading belt at dock operates.

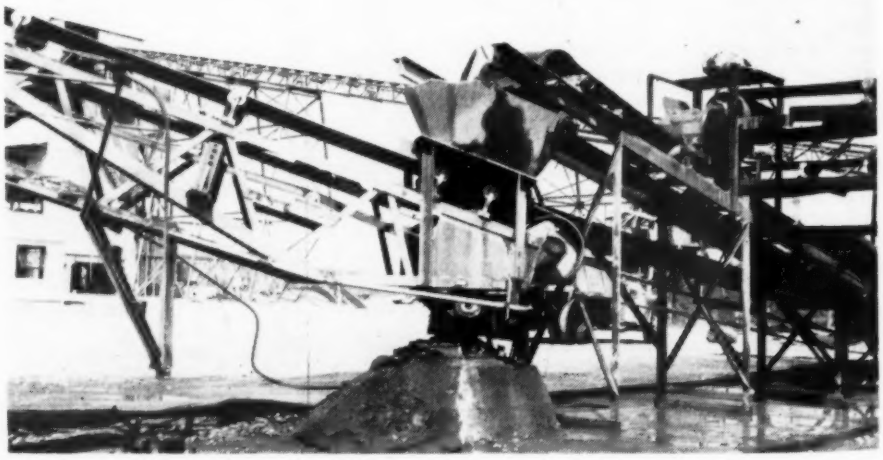
Grizzly, primary crusher and feeder are mounted near the top of this structure

sizers. A head tank for fresh water for the sizers is provided; about 200 tons per hour are used. Overflow from the sizer, from its appearance, is practically all water as the liquid is just slightly discolored.

The use of these Dorrco sizers in a sand plant sets a pattern for sand to be classified within narrow limits, for in this 8-pocket machine, if desired, eight different sizes of sand can be made and the particle size of each pocket controlled within narrow limits.

The Dorrco sizer consists of a tank, trapezoidal in shape, that is divided into eight pockets. Feed is introduced into the narrow end of the tank into the feed compartment, each compartment being equipped with a constriction plate in which a preliminary sorting takes place. By adjusting the upward velocity of the water in each pocket, particles within a narrow size range can be detained in and discharged from each pocket. Discharge of the sand from each pocket is entirely automatic with controls being through a Pressurtrol regulator supplied by the Minneapolis-Honeywell Regulator Co. Its operation is based on the hydrostatic head resulting from the gravity of the bed of pulp that is in suspension in each pocket which is magnified to give power operation to the discharge valve. Water flowing up through the constriction plate in each compartment furnishes a rising, sorting current with control of the volume of water being through a pinch-valve serving each compartment. Glass windows are provided on one side of the machine for observation of conditions within each compartment. No manual adjustments are necessary except when abnormal feed conditions occur. At the plant of the Pacific Building Materials Co. the two sizers operate with practically no attention.

Sand from each compartment discharges at about 50 percent solids. The first three compartments from both units are allowed to join and they flow to a de-watering drag. This material is minus ⅛-in., plus 14-mesh material. Compartments Nos. 4-5 and 6 are similarly joined and flow to another similar de-watering drag. This material is practically all minus 14-mesh, plus 30-mesh. The finer material from compartments Nos. 7 and 8 join and flow to a small de-watering screw. This material is minus 30-mesh, plus 150-mesh. The sand drags are both 24-in. wide and were supplied by the Washington Machinery and Storage Co. The first drag



Close-up of the lower or toe end of the radial stacker showing its general design and the feed belt

discharges to its bin, and is the so-called "coarse sand." The second drag makes the intermediate concrete or mason's sand that falls to a bin. The fine sand from the screw de-waterer likewise goes to its bin.

To prepare the concrete sand a blend is later made that is made up as follows:

Minus ¼-in., plus ⅛-in. from the Simplicity screens .....4 percent
Drag No. 1, compartments 1-2-3-(Minus ⅛-in., plus 14-mesh) .....35 percent
Drag No. 2, or compartments 4-5-6 (minus 14-mesh, plus 30-mesh) .....23 percent
Sand from screw de-waterer (or so-called "muck sand"), compartments 7 and 8 (minus 30, plus 150-mesh) .....38 percent
TOTAL .....100 percent

A second pile is blended as follows:

Minus ¼-in., plus ⅛-in. screenings .....6 percent
Sand from first drag.....58 percent
Sand from second drag....36 percent
TOTAL .....100 percent

A third pile of the muck sand or minus 30, plus 150-mesh is also maintained.

Ample Storage and Blending Facilities

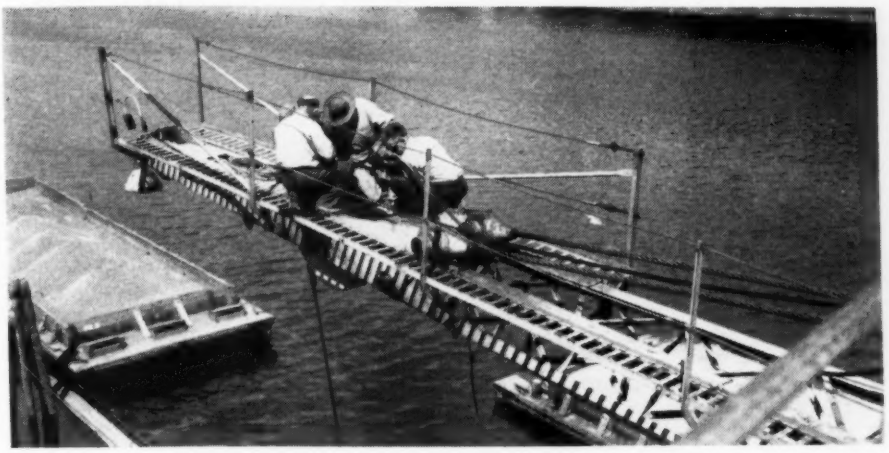
From a review of these data it will be seen that the plant can produce five sizes of un-crushed gravel at one setting and a wide variety of sand sizes that can meet any practical specifications.

Aside from the "muck sand bin" that sets off to itself somewhat in the general assembly of storage bins, there are nine 16- x 16-ft. cylindrical steel storage bins under the plant arranged in three rows of three bins each. Five of these bins are "splits" with a division wall making them into two compartment units. The sketch gives the arrangement of these bins, their contents and the conveyors serving them.

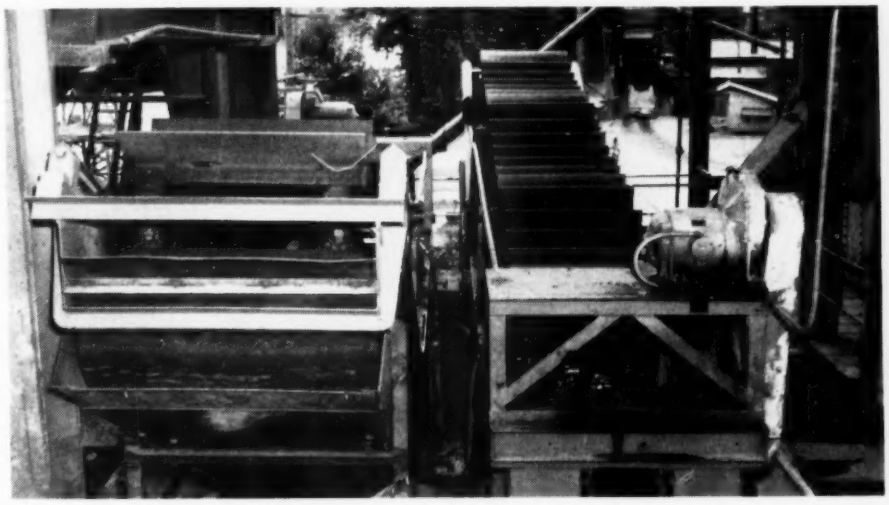
Considering first the block of nine bins, three bins in three rows: there is a 24-in. wide belt under each row, the three belts being reversible. When carrying material in one direction the three belts (one or all of them) discharge to a 24-in. cross belt that in turn dumps to another 24-in. belt that inclines up over a considerable distance to the ready mixed concrete plant. This long belt rides on Rex idlers. The first mentioned cross-belt has a steel hopper at its back end with a dirt ramp leading to it so that trucks can dump material to this hopper and in so doing supply the batching plant.

When the three 24-in. belts under the bins are operated in the opposite direction, they (one or all of them) discharge to a reversible 24-in. cross belt. This cross belt, when operated in one direction, carries material to a steel truck loading bin, or the material can by-pass the bin and continue on to the shuttle belt at the dock for loading barges for river transportation. This reversible cross belt, when operated in the other direction, discharges to a long radial stacker that builds the ground storage piles. Under the "muck sand bin" is another belt conveyor that delivers to this reversible cross-belt. It will be noted that the belt conveying system is a very efficient and flexible unit.

Gates serving each belt were built by company forces, and comprise a cylindrical outlet from the bin with a horizontal moving plate section that



Splicing a cable on the boom 75 feet above the river



Two drags for removing soaked wood chips

Barge loading shuttle belt. Raising device can be seen at a point past center

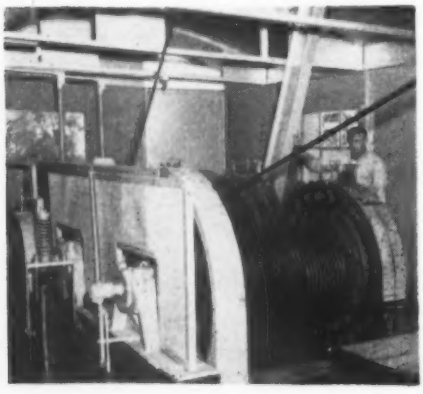
Long 24-in. belt conveyor inclining up to the ready mixed concrete plant. Belt is vulcanized for continuity and reduced maintenance

can be opened and closed by pulling or pushing horizontally on the arm serving this sliding member. The operators soon learn the setting for each gate when a blend is being made, for each day screen analyses are made at the plant's laboratory and the operator is given a copy of the findings so that he may make corrections on his gate settings.

All the belts are Goodyear "Iron Clad" brand. The splicing on all belts is a vulcanized job done by a local concern and costs $1 per inch. They make an excellent splice and it is well worth the cost, according to the company's experience.

The radial stacker, made by the Helser Machine Works and distributed by the Balzar Machinery Co., of Portland has a 24-in. belt and a total length of 200-ft. At the high end it is 60-ft. above the ground. The belt conveyor system serving the loading barges can handle material at the rate of 250-cu. yds. per hr. The stacker can swing through an 180-deg. arc, and is supported near its outer end by a substantial carriage that rides curved steel rails. The radial stockpiler is moved through a Pacific Gear reduction unit and "V" belts by a small G.E. motor with rheostat controls. The drive equipment rides the supporting car. Materials stockpiled by this unit are reclaimed by a Marion clam shell rig.

Considerable barge loading is done at the plant for material can be shipped to river points or to the company's other plants. Sometimes a barge is used as a floating stockpile, especially for the two sands produced, concrete sand and mason's. At the dock is a 30-in. shuttle belt that can be raised at the outboard end through a 1500-lb. Budgit hoist that is controlled by a hand lever. The shuttle belt can also move horizontally on a suitable track. It was built locally.



Three-drum hoist for operating gantry crane which unloads tow boats filled by dredges

Water is supplied the plant by two 8-in. discharge vertical pumps; one supplied by A. D. Cook, Inc., is driven by a 25-hp. vertical, Triclad, G.E. motor, and the other pump is a Layne.

The Pacific Building Materials Co., and its subsidiary, the Readymix Concrete Co., were organized in 1922. These two companies operate two gravel producing plants and three ready mixed concrete plants; two building material warehouses, a fleet of 75 trucks and have 170 employes. Harold Eykelbosch is president and Frank Penepacker is vice-president and secretary of the parent company.

Safety Measures for Shovels, Draglines

PROPER precautionary measures in the operation of power shovels, draglines and similar equipment, which measures can do much to eliminate accidents in the quarry, are described in a bulletin, Industrial Data Sheet D-Gen. 25 — "Operation of Power Shovels, Draglines, and Similar Equipment," released by the National Safety Council. In general, a systematic inspection procedure should be used for checking new equipment, inspecting, cables, brakes, and other parts regularly, examining and testing the ground system periodically, and observing the bank and face constantly, the bulletin reads. Good maintenance is a must. A program should be conducted to familiarize repairmen with the hazards of the equipment, such as the danger of making repairs when parts are in motion and of handling heavy parts. The bulletin also suggests use of personal protective equipment, especially safety shoes and goggles by repairmen, and training of operators not to overload, to load properly, to warn workers to keep clear of the shovel, to get on and off carefully, and to follow similar safe practices.

Radiant Heating System Solves Weather Problem

UNSEASONABLY cold Winter weather created a serious problem at the Construction Materials Co. concrete plant, St. Louis, Mo., last Winter until the installation of a novel radiant heat system was made by a local contractor.

Construction Materials Co. produces ready-mix and transit-mixed concrete. When the extremely low temperatures struck the city, men working on the upper levels of the "batching tower," down which concrete ingredients flowed to the trucks, refused to report for work. On the job high above ground on an unprotected superstructure, the batching crew was exposed to all the high winds and temperatures as low as seven degrees below zero.

Several solutions, including heavy aviation clothing, screens and the like, were tried without success, production falling to an extremely low level. Finally the right answer was found in the form of a radiant heating system, installed in the concrete slab floor beneath which the mixer trucks roll for refilling.

One-inch radiant heating pipe was laid on 12-in. centers to completely cover the area of the first tower level, and sunk in a new concrete flooring. High pressure steam for the system is delivered from the yard's own boilers and stepped up by a 1½-in. high velocity pump. Now even in coldest weather, the men on duty "feel" heat from the system, and metal equipment is warm enough to touch.

Roofing Granules

BUREAU OF MINES reports a new production record in 1947 by the roofing granule industry for the fourth consecutive year. Output totaled 1,695,420 short tons, 23 percent more than in 1946. In response to high demand for roofing for new construction and repair of older buildings, the capacity of asphalt roofing plants has been expanded substantially, consequently increasing granule requirements. Production of artificially colored granules increase 29 percent, natural 13 percent, and brick 3 percent. Granule values have increased comparatively little, however. For example, from 1944 to 1947 average value of artificially colored granules increased 8 percent.

Sand Company Moves

WHITEHEAD BROTHERS Co., oldest industrial sand producer in the country, has moved its offices to 324 West 23rd street, New York, N. Y.

What Causes Defective Concrete?

Studies indicate that excessive additions of gypsum may be the source of trouble

By J. A. SLEGTEN*

ACCORDING to F. H. Jackson† defective concrete structures increased from 33 to 73 percent since 1930. Numerous doubts have arisen concerning the value of extremely fine grinding. If progress is negative, why not sound the alarm and try to find out where and how we lost the track. Mr. Jackson suspects sulfo-aluminate of lime. So have I for 20 years, since the development of quick-hardening cements. Is the cement guilty, is concrete, or both?

Some actual standards admit 3 percent SO_3, which means from 6 to 6.45 percent gypsum. The following reasons bring me to the belief that this means trouble and expansion.

Compare evolution of compression to tension ratios which have gradually increased. In German specifications, normal mortar rated 10 to 1 in 1887 and 1909; 11.7 to 1 in 1928. Actually, Belgian specifications correspond to 14.8 to 1 for normal, 16.7 to 1 for high-resistance, and 18 to 1 to quick-hardening cements.

In fact, (see Curves, Fig. 1) up to 7 percent increase in gypsum gives a higher compression, particularly at 24 hours. But tensile strengths go up until the gypsum reaches 5 percent, when they start dropping. The curves show the result of 85 tests on 14 Swiss, Belgian, Dutch and French clinkers.

By the Gygi test, I perceived destruction at 28 days on a normal portland cement containing 3.73 percent SO_3. This testing method confidentially taught to his pupils by the previous Director of Holderbank, consists in daily observation of a neat cement cake, heated during 8 hours in 180-deg. air. It is undoubtedly an ancestor of the autoclave test which although not intended for this purpose is really more a gypsum test than anything else. I feel sure that three samples of the same 12 percent C_3A containing portland cement, with O percent, 4 percent and 8 percent additional gypsum would fix this point. But if 3.73 percent SO_3 started peeling cement off (7 percent Al_2O_3 content), after 28 days in water, is not a lower proportion able to do so in a less noticeable way over a long period?

Let us look at "Hydraulic Properties of Mineral Components (Technical Paper 78 of Bureau of Standards

(Continued on page 112)

*Consulting Engineer, Mons, Belgium
† Ch. Engr., Public Roads Administration

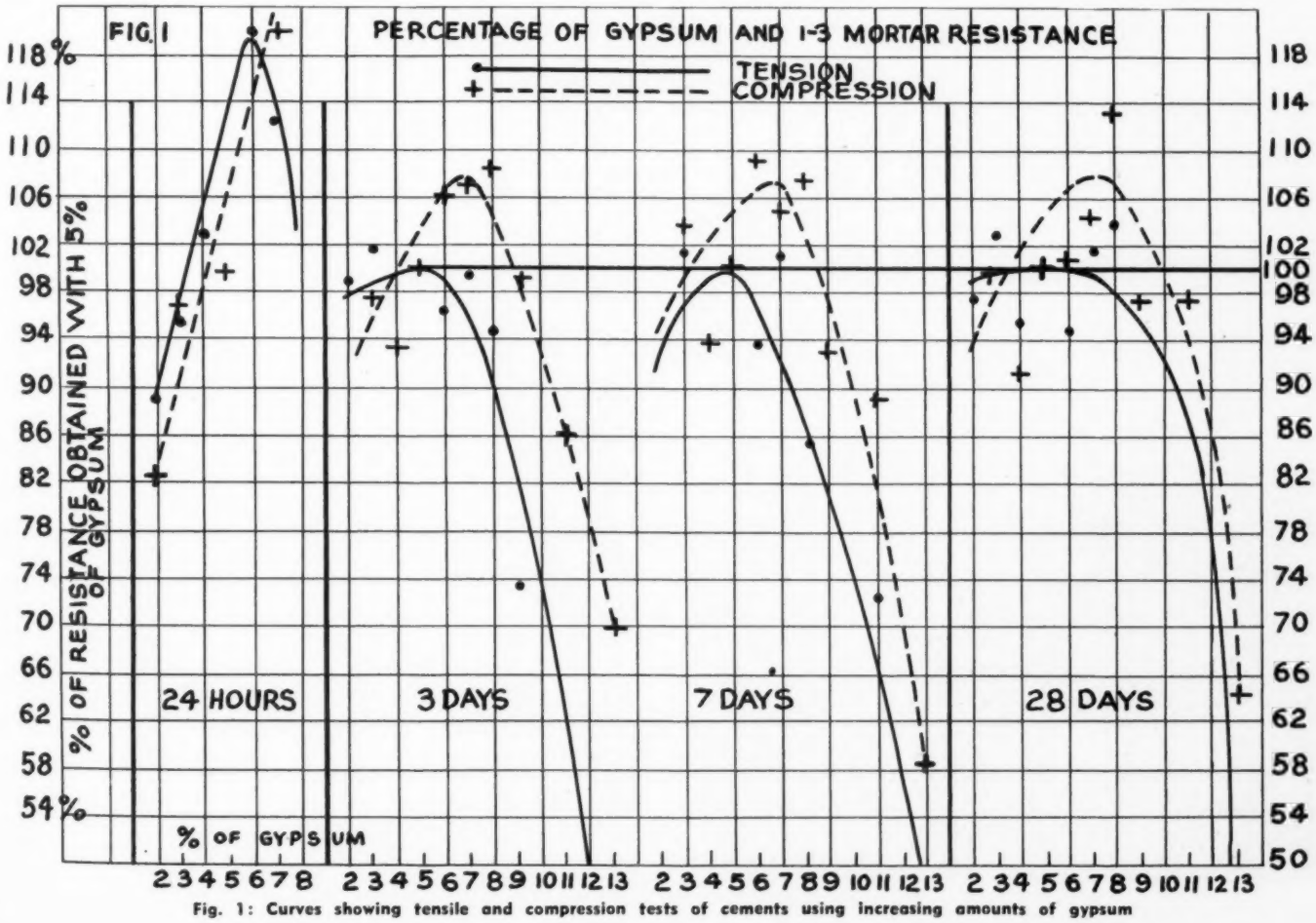
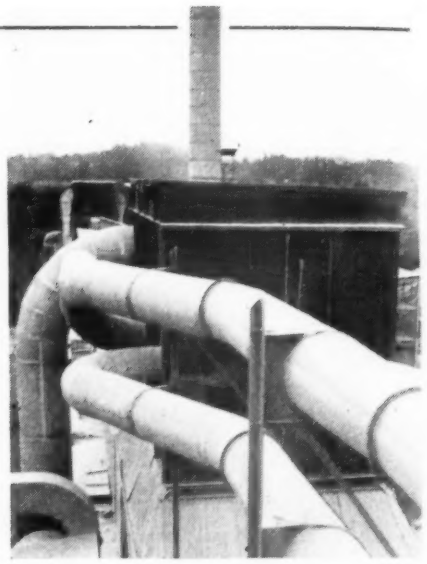


Fig. 1: Curves showing tensile and compression tests of cements using increasing amounts of gypsum

UP CEMENT PRODUCTION With New Crushing Plant and Long Kiln



Close-up of dust collector serving crushing plant. In the background may be seen collector serving agstone plant

Oregon Portland Cement Company's new crushing plant at Oswego, has efficient system of dust collection. New kiln equipped with electrical precipitator for dust recovery

By W. B. LENHART

IN THE NORTHWEST the cement manufacturers are looking forward to a steady demand for portland cement to last several years. The vast store house of natural resources in the northwest is gradually coming into its own as the industrial and recreational advantages are becoming more and better known. Many Eastern industrialists are taking advantage of the opportunities offered in this great area.

The Oregon Portland Cement Co., with plants at Lime and Oswego, Ore., has enlarged, and modernized its plant at Oswego to meet present and expanding demands of the future.

Flood Control—Irrigation Create Big Cement Demand

In this region the housing situation has become particularly acute as a result of the recent disastrous floods on the lower Columbia river. The highway programs in the Northwest are just getting into gear, and the industrial expansion can be measured by the numerous large dams authorized and proposed for construction in the States of Oregon, Washington and Idaho.

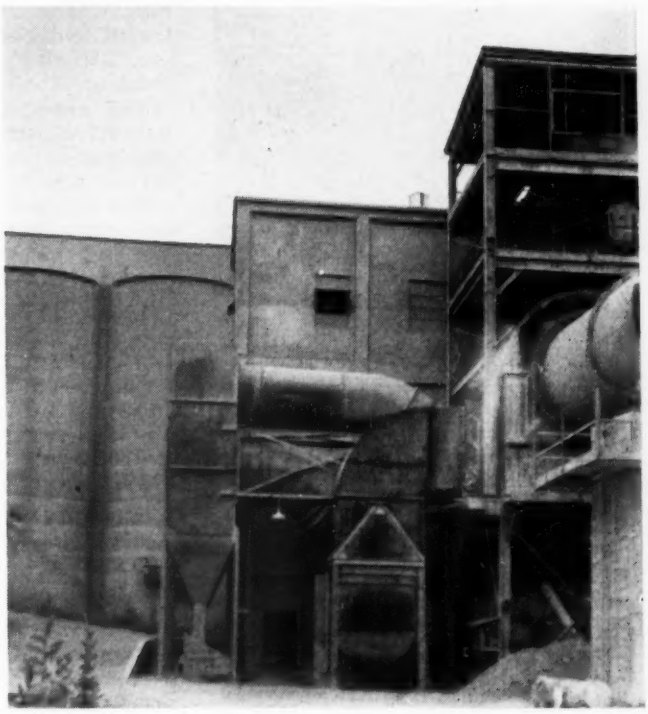
Along with the power development program and coupled with it are irrigation projects and flood control programs that will keep the area well in the foreground as a user of portland cement. By enlarging its production facilities at Oswego, the company is showing its confidence in the continued growth of the Northwest.

Almost a year ago, the author inspected this plant and was present the

View of kiln from feed end. It is in three sections, and 287 ft. long

Looking toward feed end of new kiln. Note cooler at firing end

Crushing plant. Structure on top of silo is one of the dust collectors



Section of electrical precipitator dust collector at feed end of new kiln

day the first fire was lighted in its new Smidth kiln. Recently the plant was inspected a second time after major improvements had been made. With many structural items difficult to obtain, the plant is still in the latter phases of completion, but the improvements yet to come are of a minor nature. Both the new and the old kilns have been in constant operation during the past year. We are indebted to Frank E. McCaslin, president, and D. H. Leche, vice-president and general manager for permission to visit this interesting operation and to H. R. Shipley, superintendent, for courtesies extended. In the June, 1947, issue of ROCK PRODUCTS, the agstone production facilities of the Oswego plant were described.

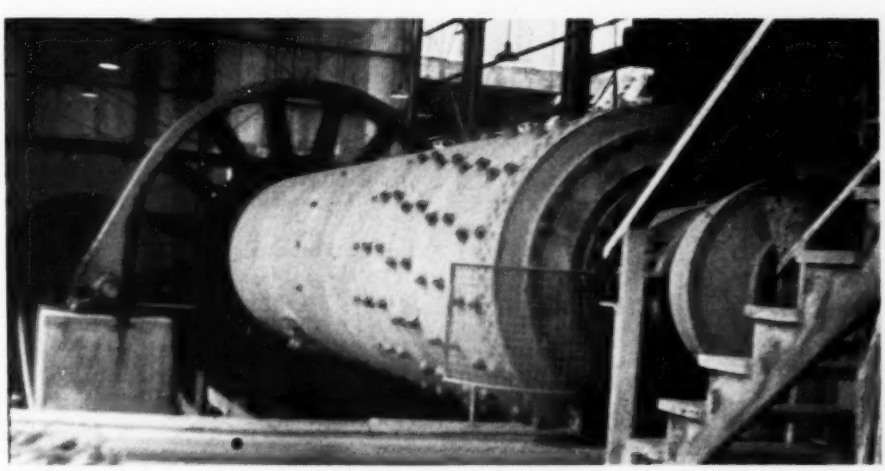
Raw materials used at Oswego are a high calcium limestone shipped to the plant in open cars from the Lime, Ore., operation, and a dark colored, low calcium limestone from Dalles, Ore. The two limestones are put through the crushing plant separately, and are later blended ahead of the raw grinding mills. No clay is used. For the low heat cements quartz is sometimes added so as to raise the fusion point of the clinker.

New Crushing Plant

An entirely new crushing plant has been installed at Oswego. The gondola freight cars are dumped to a 42-in. pan feeder that serves a 20-B, Telsmith gyratory crusher. All the stone is reduced at loading points so that it can be handled by the gyratory crusher. For secondary crushing a Pennsylvania reversible impactor mill is used. This hammermill operates in closed circuit with a 5- x 12-ft. Tyrock double-deck screen with a wear-taking top deck of slotted wire cloth and a lower deck with ½-in. mesh. Oversize from both decks returns to the hammermill. The primary crusher is driven by a 150-hp. Westinghouse motor with a flat belt drive. The impactor crusher also requires 150-hp. but is driven through "V" belts. The crushing plant easily handles 100 t.p.h.

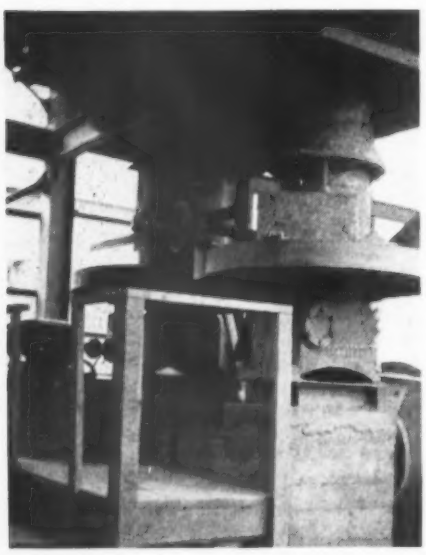
In the crushing plant are two bucket elevators. Originally it was planned to have the primary crusher discharge its product to a short bucket elevator that in turn fed the hammermill direct without separating the fines. The hammermill was to discharge to the boot of the second and taller bucket elevator which in turn delivered to the vibrating screen with the oversize chuted back to the hammermill. However, when this unit was operated in this fashion in wet weather, the fines in the limestone caused the buckets to load up and not dump properly, chutes were plugged up, and the plant's capacity was seriously impaired. To overcome this serious condition, use of the first elevator was eliminated and both crushers now discharge to the second and taller unit. Thus by mixing the two crusher discharge products and sending them to the Tyler screen the trouble was corrected. Plans are afoot to increase the height of the second elevator to permit discharging to the scalper screen, so that particularly in dry weather the original set-up can be used and thereby increase the capacity of the plant materially.

Minus ½-in. rock from the lower deck of the scalper is chuted to a 24-in. belt conveyor installed over the top of 10 concrete silos, each holding 1000



Three-compartment mill for raw grinding

Draft fan at firing end of kiln



Two disc-type feeders serving the finish grinding mill

Two constant weight feeders that supply raw grinding mill

tons, where the crushed rock is unloaded to the desired silo by a tripper. The silos are part of the older plant.

The crushing plant has its own General Electric sub-station control. All sources of dust generation are enclosed in hoods, and the dust is drawn by fans to an American Foundry dust collector.

Raw Grinding

In the old section of the plant, the raw side consists of a ball mill and two 10-ft. Cylpeb mills, and on the finish side are a ball mill and two 20-ft. tube mills. These grinding units are operated in connection with a series of screw conveyors and bucket elevators, utilizing to some degree the older conveying equipment.

On the raw side of the newer installation, the crushed limestones (the high lime and the low lime) are reclaimed by a belt conveyor and a bucket elevator and delivered to two steel bins that serve a Unidan mill. This 3-compartment mill is driven by an 800-hp. General Electric synchronous motor from a G.E. control panel on the operating floor.

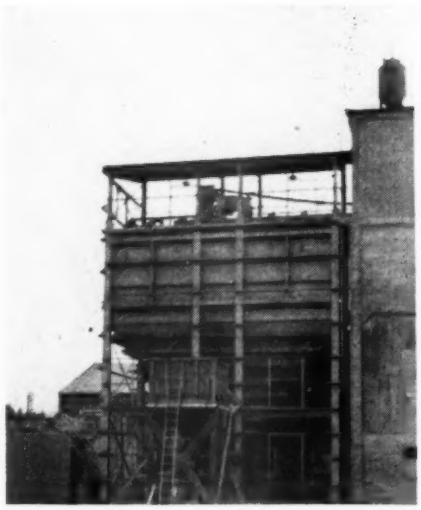
The raw materials are fed to the mill by two Hardinge "Feedometer," constant weight feeders which discharge to a short belt conveyor that serves the Unidan mill. A temporary bin also has been equipped with a Feedometer so that silica can be added to the raw grind when desired.

The Unidan mill discharges to a sump from which two 3-in. Wilfley pumps deliver to two new concrete mill slurry basins, each 36-ft. in diameter and 30 ft. deep. They are air and mechanically agitated.

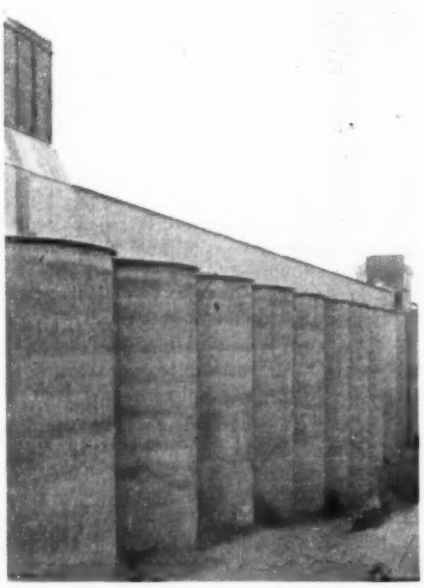
A 5-in. Wilfley pump delivers slurry in the mill basins to the kiln feed basins. From the kiln feed basins the slurry is pumped by three 2-in. Wilfleys to ferris-wheel type, kiln feeders. These slurry mixing and blending units also serve the older grinding equipment and the older 9- x 10- x 210-ft. kiln having a rotary cooler under it.

Add New Kiln

The new kiln is 287 ft. long, and and is 9- x 8- x 9-ft. in diameter in the three sections. It is an oil-fired kiln provided with Unax coolers and rides on five tires. Oil at 300 lb. pressure is delivered to the burner. Heated air from the cooler is tempered with cold air and forced as secondary air into the kilns by fan. The fan is operated by a 20-hp. G.E. motor. On the operating platform is an F. L. Smidth centralized control panel on which are mounted Leeds and Northrup potentiometers, draft gauges, and other kiln operation instruments and controls. Trumbell and A.B.C. and Westinghouse control and safety switches are mounted on a separate



Steel bins which feed raw grinding compartment mill. Small bin in foreground is for feeding additional silica when required



Ten raw material silos, each holding 1000 tons

Pipe in background receives dust from area where ½-in. rock falls to the belt conveyor

panel. The burner used is a one-tip unit, and uses about 600 gal. of oil per hour. The kiln is driven by a 30-hp. G.E. Tri-clad, adjustable speed motor through a Falk reduction unit. As a standby, an International gasoline engine is available in the event of power failure. Safety covers on the sprockets on the kiln drive assembly are then removed, a chain is placed on the sprockets and operations are resumed with the gasoline engine. Clinker from the Unax cooler falls to a chain drag conveyor, and is delivered to the older clinker storage system.

The induced draft fan forces the dust laden gases from the kiln through the electrical precipitator and thence to the stack.

At the time of inspection, the kiln operated at 66 r.p.h. The clinkering and calcining zones are lined with 70 percent alumina brick and the drying and preheating zones with 40 percent alumina units. Its rated capacity is 1700 to 1800 bbl. of cement per day. The total capacity of the Oswego operation is close to 3000 bbl. per day.

On the finish side is a new Smidth 3-compartment, Unidan mill driven by a 900-hp. G.E. synchronous motor. It is fed by F. L. Smidth horizontal, disc feeders that operate through Cleveland reduction units. At time of inspection, gypsum was being added and premixed to the clinker ahead of this mill and thence delivered to the storage bin ahead of the grinding unit and so only one disc feeder was in use. However, it is planned to extend a flat belt conveyor from the older bucket elevator (on the gypsum delivery system) so that the second compartment in the bin ahead of the Unidan can be filled with gypsum. When this change has been made, the second disc feeder serving the grinding mill will be placed in service. The shell of the Unidan finish mill is sprayed with cooling water. The mill is provided with a G.E. control panel on the operating floor.

Gypsum was formerly delivered to the plant in closed cars, but now all this material is received in gondolas and the cars are unloaded with a small, Model H-2, Hydro crane which discharges to the boot of the bucket elevator or to ground storage. The crane is mounted on an International truck.

General offices of the company are in Portland, Ore. Oswego is about eight miles south of Portland on the Willamette river. The plant suffered no damage from recent floods in the area. F. E. McCaslin is president; D. H. Leche is vice-president and general superintendent; H. R. Shipley is works manager; and R. W. Anderson is chief chemist.

Letter to the Editor

Dear Sir:

"I believe a slight error is contained in Rocky's Notes in the March, 1948, issue of ROCK PRODUCTS. Under the heading, 'Faulty Subgrades,' you made the following statement: 'One evidence of faulty subgrade is the pumping action of concrete slabs under heavy wheel loads. Iowa state highway studies have led to the conclusion that pavements placed on subgrade soils that contain not less than 50 per cent of the fraction retained on the No. 270 sieve (0.05 mm. particles) do not have this trouble; and that subbases composed of granular materials placed over fine-grained or pumping soils will prevent pumping.'

"We believe the conclusion contained in your statement is correct. However, we believe you have given the Iowa State Highway Commission credit that the organization does not deserve. The conclusion quoted was expressed by the Committee on Pavement Pumping of the Department of Maintenance of the Highway Research Board. Perhaps the fact that W. H. Root, maintenance engineer of the Iowa State Highway Commission, is chairman of the Maintenance Department of the Highway Research Board has caused you to credit the Iowa Highway Commission with the results of work done by one of his committees.

"The Iowa Highway Commission has made no study of the factors affecting the pumping of concrete slabs. We have not discovered evidence of this particular defect in any of our pavements that have not reached a rather advanced stage of failure from other causes. Therefore, we have had no opportunity to study this particular problem in pavement design.

"Mr. Root has been on the alert to discover any pumping that may have occurred and has instructed his field engineers to report any condition suspected to represent pumping.

"The writer has an hypothesis as to why there is no pumping of Iowa pavements that are in an otherwise stable condition, but it does not appear to be accepted by those who have made the most extensive studies of the subject.

"We doubt that anyone has been seriously harmed by any inaccuracy in your statement, but we are sure that you are interested in giving credit only where it is due.

"Very Truly Yours,

BERT MYERS,
Engineer, Materials and Tests"

LANNING LIME CO., located near Oswego, Kan., for the past two years, has announced plans to move to Iowa where the company has a contract for road work.

Diamond Drilling Blast Holes

DIAMOND DRILLING blast holes at National Gypsum Co.'s Bellefonte Mine, Centre County, Penn., is discussed in Information Circular 7438 released by the Bureau of Mines. The principal advantages of drilling blast holes in stopes at the Bellefonte mine are increased safety for the workman and greater efficiency in breaking ground, the report states.

Beds of high-calcium limestone are mined by shrinkage stoping. The limestone is hauled by electric trains from the stopes to an underground crusher, thence conveyed by belts to surface for calcining. Diamond drills operating in slots at either end of 300-ft. stopes put in horizontal slabbing holes 140 ft. in length. This has increased stoping efficiency with respect to tons broken per pound of powder, tons broken per foot drilled, feet drilled per machine-shift, tons broken per man-shift, and tons broken per machine-shift. Two men are employed on each diamond drill as against one man on a percussion drill in stopes.

Partial bit records show the diamond bit-replacement cost for 7 bits which drilled 14,228 ft. was $0.0112 per ft. drilled. The diamond loss on 8 bits which drilled 31,280 ft. was 0.0012 carat per ft. drilled. The average footage for 14 bits which drilled 45,836 ft. was 3274 ft. per bit, while the minimum was 165 ft. and the maximum 7326 ft. per bit.

P.C.A. Personnel Training Course

THE PORTLAND CEMENT ASSOCIATION announces its Third Technical Personnel Training Course to be held at P.C.A. headquarters, Chicago, Ill., beginning October 4, 1948. The course is being divided into three sections this year. Section I, lasting 5 weeks, will survey the Association's program, policies, procedures, and literature with major emphasis on technical training in the fundamentals of making and placing quality concrete. Section II, lasting 5 weeks, will be a detailed study of P.C.A. promotion policies, programs, techniques and literature with special emphasis on training required to fit a man for P.C.A. work. Section III, lasting up to 13 weeks, will be a specialization section for selected individuals, and will include advanced study and on-the-job training designed to fit the needs of the individual trainee and to prepare him for assignment to a specialized field of work.

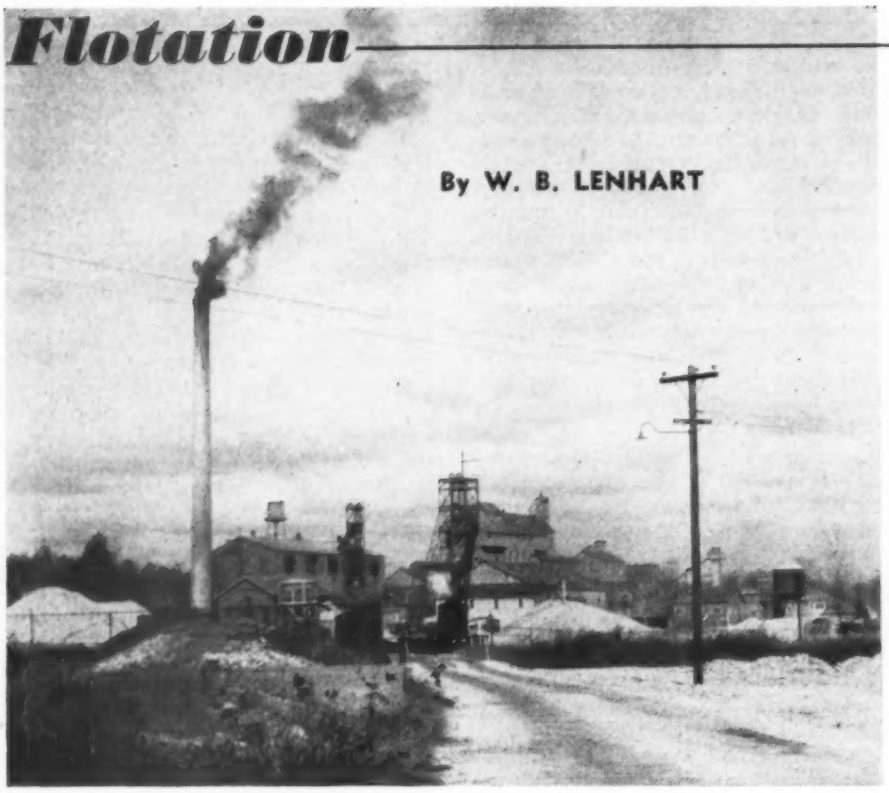
Limestone Quarry Sold

JOHN AND LEWIS MILLER, partners, Miller Bros., limestone quarry and coal operations near Gallipolis, Ohio, have sold out to Roger King, thus dissolving their partnership.

SINK-FLOAT PROCESS

By W. B. LENHART

Successfully used in mineral separation of metallic ores, has definite possibilities for recovery of valuable industrial minerals. It is now used extensively for fluorspar and magnetite processing



This plant, operated by Rosiclare Fluorspar & Lead Co., was the first to use the sink-float method of ore separation in this area and is using a 14-ft. diameter cone

IN THE rock products industries, there is undoubtedly a definite place for the so-called Heavy Media or Sink-Float process, as it affords a cheap, simple, and efficient method of separating rocks of different specific gravities and the removal of deleterious materials. For example, in the sand and gravel industry, this process can be used for the removal of waterlogged wood chips, coal, clay-balls or any other products from gravel, provided there is a slight difference in the specific gravities of the products being separated.

With this fact in mind, the writer visited sink-float plants during the past year in the states of Washington, Colorado, Illinois, Tennessee, and Kentucky and observed six different industries where sink-float equipment had been installed. Five of these plants were in operation at the time of inspection.

Fluorspar being washed at finish end of the mill, Inland Steel Co., plant near Marion, Ky.

Just because most of these plants happened to be in the industrial minerals division of the rock products industries, it does not necessarily follow that the sink-float process can be confined to such minerals. It only indicates that the industrial minerals industries are on their toes setting a pattern; doing pioneering work for a process that could have a greatly extended use for the bulk treatment of such low cost commodities as concrete aggregates.

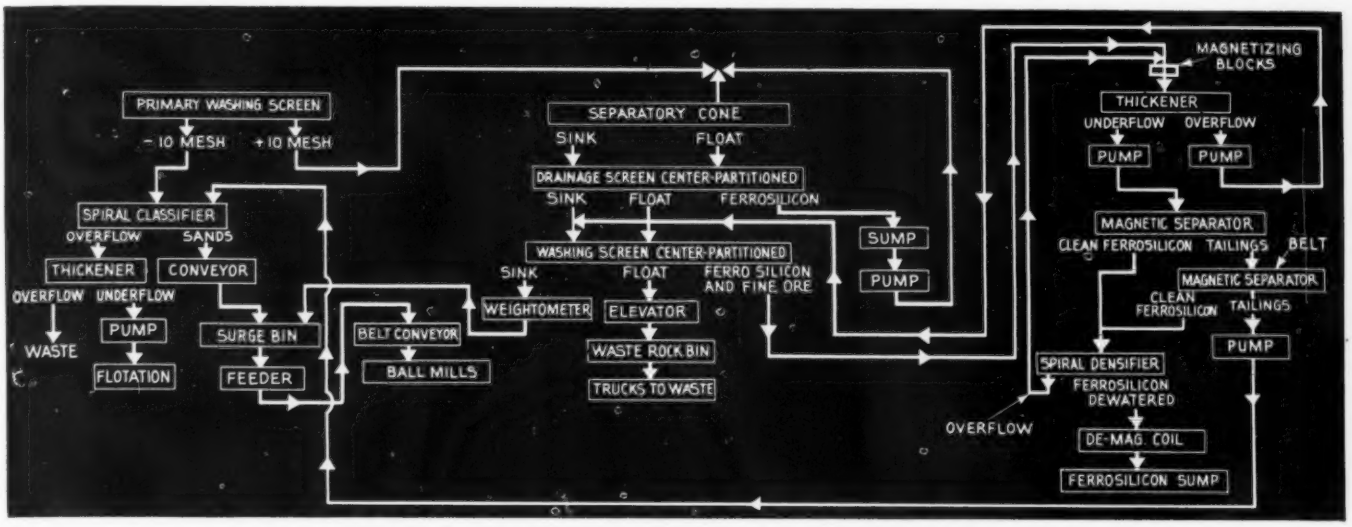
Plants visited included the Northwest Magnesite Co., Chewelah, Wash.; Western Fluorspar Co., Cowdrey, Colo.; Alcoa Mining Co., and the Rosiclare Fluorspar Co., both of Rosiclare, Ill.; and the Inland Steel Co. and the Kentucky Fluorspar Co., both near Marion, Ky.

Many other plants are in operation throughout the United States processing coal, iron ore, lead, zinc and other metallic ores. For the most part these plants are removing a non-metallic gangue mineral which may and is often competing with commercial aggregates. The American Zinc Co. of Tennessee has a subsidiary company, the American Limestone Co., which processes "float" materials from the zinc plant to sell as an agricultural limestone. This plant near Mascot, Tenn., is only a few miles from Knoxville.

Much credit for the development of the sink-float process must be given to the Western-Knapp Engineering Co. of San Francisco, a subsidiary of the Western Machinery Co., and to the American Cyanamid Co. of New York. At all of the plants visited these two companies had a major hand in the design, erection, selection of equipment, and for the use of their joint staffs to start the new plants off on strikingly successful paths. The American Cyanamid Co. has the patent rights to the process which was developed by the American Zinc Co. of Tennessee. The former company maintains a semi-commercial laboratory at Stamford, Conn., where carlots of gravel can be processed if need be for the test removal of any light, heavy or deleterious material or make any similar separations of coarse rock. The Western-Knapp Engineering Co. has pioneered the design, erection, and through its joint company, The Western Machinery Co., supplied practically all of the equipment for most of the plants in the rock field built recently in the United States. New sink-float equipment recently was announced by Link-Belt Co.

Operating Costs

Several questions may arise in the mind of a gravel producer who might have a place for this process as to costs. Operating cost of the process naturally depends somewhat on the tonnage handled. One plant visited was processing about 1800 tons in 16 hours and the smaller plants were treating 120 tons per 8 hours. However, on the basis of 100 tons per hour, the operating costs, exclusive of



Flowsheet of 10 t.p.h. sink-float plant which uses ferro-silicon as the media

royalties, are in the 6¢ per ton range. All the plants used from one to two men per shift regardless of tonnage treated and the reagent or "Media" consumed was from 0.1 to 0.4 lb. per ton of material treated. Inasmuch as this reagent (ferro-silicon or magnetite) costs about 5¢ per pound, the reagent cost would then amount to ½ to 2¢ per ton. This cost is included in the above total. Royalties paid depend on the value of the material treated. For sand and gravel it was said that the royalty would be well within economic reason. For fluorspar it was close to 25¢ per ton of concentrate or spar recovered; not based on tons treated, or, in one case, roughly 6¢ per ton of material treated.

Another question arises as to the character of the material being treated. The process is particularly adapted to the treatment of rock from 2-in. down to 10-mesh. One plant visited was treating materials from 2 in. to 10-mesh, another 1½-in. to 10-mesh and another 1¼-in. to 14-mesh, all with equal success.

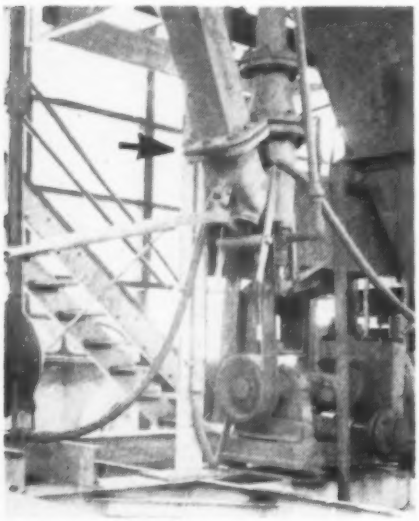
A third question that arises is the cost of the installation. Here again a wide difference can be observed. If desired, the semi-portable plant or so-called "Mobil Mill" of Western Machinery Co. can be obtained on a rental basis. Therefore any one desiring to do a little testing can do so with a very modest investment. These plants will handle from 15 to 25 tons per hour. The more permanent and larger plants will, on the basis of 100 tons per hour, spend for equipment alone around $50,000. Installation costs are nominal. The "Mobil Mill" can be erected in six days by six men, it was said. The semi-portable plants cost in the $30,000 range.

Any new process that deviates from accepted practice runs into a mental snag when the process is first introduced to the operator. When operators are confronted with such strange terms as "de-magnetizing coils," "flocculation," "media," "densifiers," etc., he is prone to jump to the conclusion that it is something complicated, technical, and to be avoided. But essentially the process is as simple as washing and screening gravel. Only the nomenclature in describing the process may be a bit strange and new. A brief history of sink-float may clear up some of the points.

Now Separates Limestone, Quartz, Etc., from Metal Ore

Years ago a process was developed for the separation of slate from coal. This called for the use of a heavy liquid in which the coal would float and the slate sink. Due to the high cost of the chemical and the inability to recover it, the process met with very limited success. However, the idea intrigued researchers. The search continued. Years later one zinc mining company found that if ferro-silicon was ground in a ball mill with water that this pulp had the properties of a heavy liquid. Solids did not settle out readily and the pulp could be built up to a high specific gravity, floating such minerals as limestone, dolomite, quartz, etc., and sinking the heavier zinc portions. Later it was found that magnetite had similar properties. Besides having the property of remaining "homogenized" to a large degree, the fact that both these materials were magnetic indicated a possibility of recovering the ferro-silicon, or the magnetite by magnetic separators, thereby keeping the cost of the reagents very low. The mineral galena also lends itself to the process but that mineral being non-magnetic limits its use. Just recently, the Stearns-Rogers Co. of Denver, Colo., is reported to have developed a process in which the pulp itself is used as the separating media. However, at all the plants visited ferro-silicon was the media, and at several a mixture of

General view of Inland Steel sink-float fluorspar plant before enclosure



Air-lift assembly at bottom of separatory cone in portable plant

ferro-silicon and magnetite was used. The proportions were about 80 per cent of the former and 20 per cent of the latter, the mixture giving less viscous media.

How Process Works

In the sink-float process a simple steel cone is used as the separatory vehicle. In this cone is the "media" or finely ground ferro-silicon or magnetite pulp. This material is supplied to the user in dry condition, already ground, and all that is required is to mix it with water to the desired pulp specific gravity.

Materials finer than 14-mesh do not work too well in the process, and at all of the six plants visited the fines were screened out of the feed as a preliminary step. However, in special cases, the process can be used with modifications on materials as fine as minus 10, plus 48-mesh, and still another "Dutch Process" modification (also licensed by American Cyanamid Co.) is said to treat still finer materials. Here, however, we will discuss only the treatment of the coarser sizes (2-in. plus 14-in. mesh).

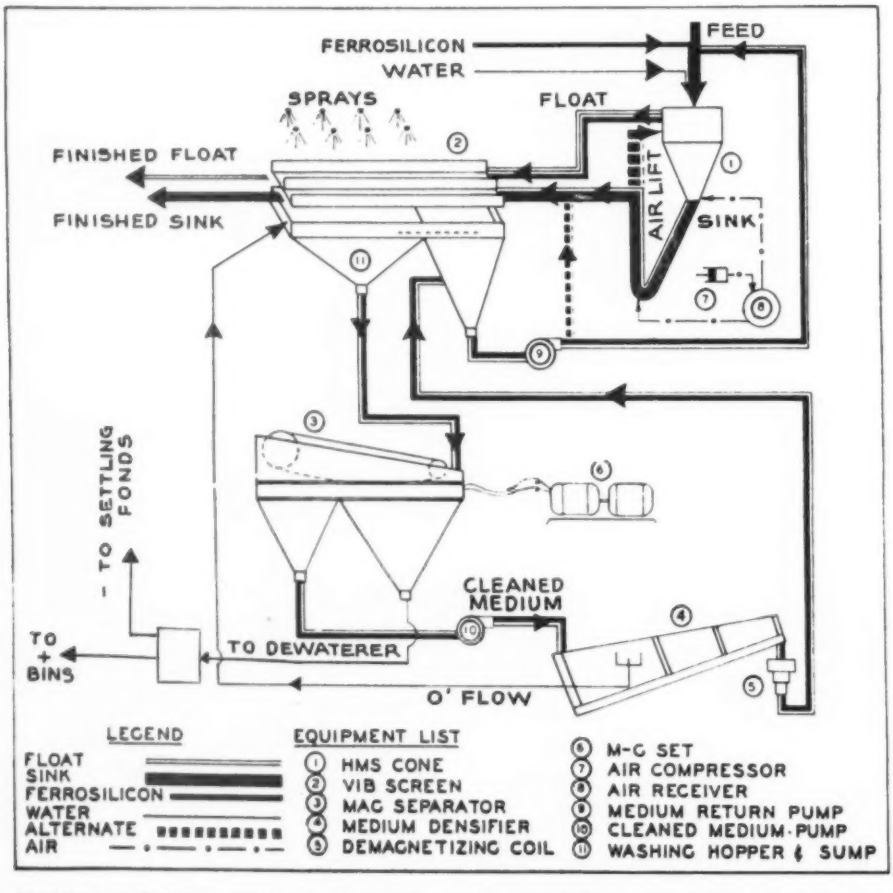
The coarse raw material is fed into the separatory cone. The heavy portions sink to the bottom where they are withdrawn by means of an air-lift that is outside the cone. The lighter portions are drawn off tangentially from the top. In all the cones a slow moving agitator is provided. This runs about 4 to 6 r.p.m. That's all there is to the separatory part of the process. The remainder of the plant is confined solely to the recovery of the media (ferro-silicon) adhering to the portions that float or sink. These two portions have been referred to in the accepted terminology as the "sink" and the "float" portions and we will adhere to this nomenclature.

When this process is observed in operation, the observer is impressed with the fact that there are no light rock particles visibly floating on the surface of the cone. Actually the rock particles must plunge into the pulp-media and be completely immersed in it. From then on there is a constant sorting action going on, the lighter rocks moving toward the surface and the heavier sinking. The slow-moving agitators give the pulp a circulatory movement and the float portion is drawn off to the washing screen through a tangential launder. Rocks of the same specific gravity as the media remain "in teeter" in the cone and must eventually be removed as a middling. This is discussed more fully later.

At one plant visited the separatory cone, 20 ft. in diameter, was handling in excess of 100 t.p.h. Another was using a 14-ft. diameter cone and was treating 40 t.p.h. very easily. Another was using a 10-ft. cone and treating 25 t.p.h. The "Mobil Mills" (two of them) had 5-ft. cones, and were handling 15 t.p.h. One of these operators, however, said that he expected to get the 5-ft. cone up to 150 tons in 8 hrs. Both these smaller plants were treating fluorspar with calcite as the main gangue or "float" mineral.

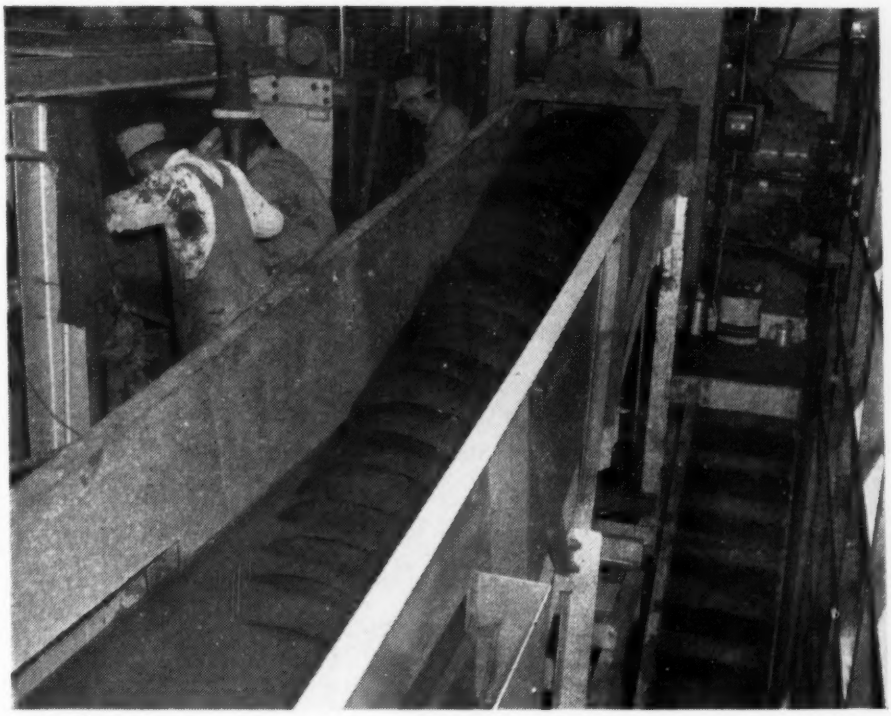
Another question that may arise is: how wide a difference must there be in the specific gravity of the rocks to be separated? Theoretically, the difference can be very slight, but actually, due to operating conditions, the best practice was to use a large diameter cone. Here a split was being made on a difference of only 0.30 in the specific gravities of the sink and the float. In other words rocks in the 2.6 sp. gr. range were being separated from other minerals in the 2.90 sp. gr. range. It should here be pointed out that with the large diameter cone, less fluctuation is present in the specific gravity of the pulp, than is the case where the 5-ft. cones are used, because of the larger bulk of media in the former cones. However, on the 5-ft. cones, fluorspar that has a sp. gr. from 3.01 to 3.25 was being easily separated from other minerals that had a sp. gr. from 2.65 to 2.8. In case it is desired to separate coal, or water logged wood chips from gravel, the spread in specific gravities would be infinitely greater. Caution should be entertained when planning to treat minerals that are porous for they could possibly absorb some of the ferro-silicon or otherwise give a false specific gravity. Pumice, for instance, in gravels might cause some difficulties as this mineral could absorb so much of the media that its recovery would be difficult, thereby increasing the costs. However, semi-commercial preliminary testing would easily prove or disprove this point.

Control of the gravity of the media is calculated by the operator who takes a pulp sample, weighs it, and



Flowsheet of sink-float plant, using ferro-silicon media, and having a capacity of 5 tons per hour

from a simple tabulation determines its gravity. On fluorspar the top gravities were in the 2.55 range and the bottom of the cone in the 2.8 to 2.9 range. If the gravity dropped, the operator fed more returning ferrosilicon from the storage spiral conveyor, referred to in this technique as the "densifier." If the gravity was too high, naturally more water was added. In such a cone with these ranges of specific gravity it would be possible to build up a load of so-called "middlings"; that is, materials, such as fluorspar, that would have some gangue attached to the spar resulting in a product that would neither sink, or float. It would remain in suspension, or "in teeter," in the cone and tend to build up and in time occupy so much of the cone's volume that operations would be interfered with. In one case where a 14-ft. cone was used, this condition was deliberately allowed to exist and once per day, air was injected into the cone sufficient to upset the relations between the pulp's gravity at the bottom and the top. This resulted in the middling product sinking almost instantly, and it was by-passed at the outlet and treated separately.



Spiral classifier in operation at sink-float fluorspar plant of Inland Steel Co.

Little Space Required

The amount of floor space necessary for one of these sink-float plants is surprisingly small. The semi-portable or "Mobil Mills" of Western Machinery Co. occupy a space of about 12- x 25-ft. with additional space for run-ways around this area. The plants are usually equivalent to a two story building although the 20-ft. cone installations are naturally higher. The 10- and 14-ft. cones have a top and middle operating floor with usually a sub-basement for drainage. The plants are so self-contained that it is practically impossible to get a photograph that will show the equipment to any advantage. The plant using the 10-ft. cone occupied an area of roughly 30- x 40-ft. and was a two-story building with an ample sub-basement for drainage.

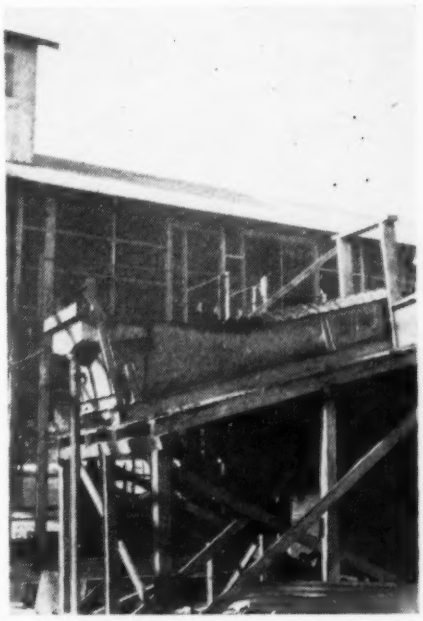
The sink-float process is continuous, but all except one of the operators were running 8 hrs. per day up to 20 hrs. This meant shutting down the plant in the interim. During these shut-downs none had drained the cone with its load of floating rock pulp or rock "in teeter," but had provisions for keeping the cone in agitation by means of a small air compressor. All the plants, however, were so designed that the cones could be drained if necessary and the media and rock returned to the system.

All the plants have air lifts to raise the sink portion to the vibrating screen used universally to wash the adhering media from the rock. As an example: in the case of the 5-ft. cones the apex of the cone's bottom is connected to a large diameter pipe (approximately 6-in.) that extends into the sub-basement about 10 ft. where the pipe, through a suitable connection extends upwards at a sharp angle to the screens located near the top of the cone. At the acute angle in the pipe air is introduced. On the 5-ft. plants, a small Chicago Pneumatic compressor supplied about 30 c.f.m. or air at 40-lb. pressure. None of the plants experienced any trouble or stoppage in the flow of rock with these lifts. Those using troublesome wet elevators for coarse rock on short lifts in other processes and industries could well study this successful use of air lifts for they are continuous and practically fool-proof with little or no wear.

Another practice that is practically universal in sink-float plants is the screening of two separate portions on the same vibrating screen at the same time. This is accomplished by dividing the screen into two parallel sections with a partition. Thus the sink portion goes down one side and the float down the other. The total screen is not necessarily halved but is divided according to the relative amounts going down each part of the screen. This same theory at one plant was practiced on one of the off-bearing belt conveyors. Here one belt was carrying two separate products. The right half of the belt was carrying one product and the left half another.

In all of the plants visited the sink portion was the valued and sought for product. The float was waste (exceptions noted) but if the plants had been in areas of greater population, the float portion could have been used for aggregate or ballast, and in practically all cases it was being used locally to a limited extent for that purpose. Most of the plants carried this rock off on belt conveyors, but one was using a Hydroseal pump with eminent success and pumping the rock to waste storage. Another was conveying to a point just outside the plant where it was fed to a Stephens-Adamson car-loader that literally shot the material out away from the building where the rock was loaded to trucks by a Bucyrus-Erie TD9 loader.

(Continued on page 117)



Spiral classifiers are used to dewater the minus 60-mesh, plus 48-mesh fluorspar at sink-float plant

By W. R. CLIFFE*

Fig. 5: Showing crusher house, screen house, inclined conveyor, and shuttle conveyor over rock storage bins, to the right

MODERNIZE

Vertical Kiln Stone Preparation

Berkeley lime plant of North American Cement Corporation mechanizes quarry system

FEW LIME PLANTS in the East can boast a longer period of continuous and progressive operation than the Berkeley, W. Va., plant of the North American Cement Corporation. The quarry, which is located about six miles northeast of Martinsburg, has been in production for almost 50 years.

The quarry is in the Moshein Vaughanite sequence which, in the area of operation, has a strike almost due north and a dip of 62-deg. Present operation is on both sides of the county road leading from U. S. Route 11 to the plant site. The deposit on the north side of the road is 75-80 ft. in width, on the south side of the road, 140-150-ft. in width. In driving the portal connecting the two quarries it was discovered that a fault exists directly under the road. The presence of this fault accounts for the clear line of demarcation between the narrower and wider sections of the quarry. The footwall breaks cleanly, and, with the widths above noted, the quarry lends itself to open pit operation.

History

Originally opened for the extraction of fluxing stone, the property was purchased in 1907 by a group headed by Charles Warner, now chairman of the Loard, the Warner Co., Philadelphia, Penn., who organized the Berkeley Lime and Stone Co.

At approximately the same time the Maryland Portland Cement Company was organized under the direction of De Courcy Thom and Loring A. Cover of Baltimore for the purpose of building a cement plant on the outskirts of Hagerstown, Md.

By 1910 the need for large expansion programs at both plants became apparent. The Berkeley company needed large modern lime kilns and a hydrate plant, the Maryland company required increased cement mill capacity. The acquaintance between the two groups brought about the view that the expansion program could best be developed, managed, and fi-

*Consulting Engineer, L. I. M. E., Hershey, Penn.

Fig. 3: Stiff leg derrick boom with rock box at highest position. Auxiliary dumping rack may be seen to the left

Fig. 4: Discharging stone at the dumping rack

nanced by consolidation especially since the two plants were only 16-miles apart. This thinking culminated in the organization of the Security Cement and Lime Co.

Under the general guidance of Warner Co. engineers and the direction of J. N. Kennedy (later of Day and Zimmerman, now retired) acting as chief engineer, both the lime plant at Berkeley and the cement plant at Security were expanded and modernized. The Berkeley plant when completed included crusher and kilns, hydrate plant and pulverized limestone plant, and represented at that time the last word in lime plant procedure. It is reported to have been the first plant in the lime industry to use purchased electric power.

In 1925 the two plants became a part of the North American Cement Company under whose direction they have continued in operation up to the present time.

Purpose of Modernization

Between the years of 1910 and 1947 the stone requirements of the vertical kilns controlled the quarry practice. Hand loading methods were used and men and mules worked out the kiln stone and spalls.

The limitations imposed by outworn methods of quarrying were further complicated by the necessity of hauling on an incline some 1200-ft. in length placed at right angles to the strike of the ledge. As the bottom of the quarry was taken up during the years, this incline had reached the point where the difference in elevation between the quarry floor and the top of the kilns was as much as 230-ft. and the ruling grade on the incline was 38%. It was apparent that further deepening of the quarry would further accentuate this already undesirable condition, and would result in lower output and higher costs if existing quarry practices were perpetuated.

In view of the above conditions, management recognized the necessity of modernization and invited L.I.M.E. of Hershey, Penn., to study the situation and offer recommendations for improvement of operating practices which would result in increased output and lower production costs.

Utilization of modern mobile equipment on haulage roads with suitable grades was precluded by the depth of the quarry and the fact that the hanging wall did not lend itself to the construction of roadway facilities.

With the haulage incline and the use of mobile equipment both rejected on the basis of practicability, it was decided that the only alternative was to hoist the quarry output vertically along the hanging wall to the upper workings. Several plans of quarry and surface procedure were suggested, all of which could be designed around this decision. The plan finally selected and placed in operation is described in detail.

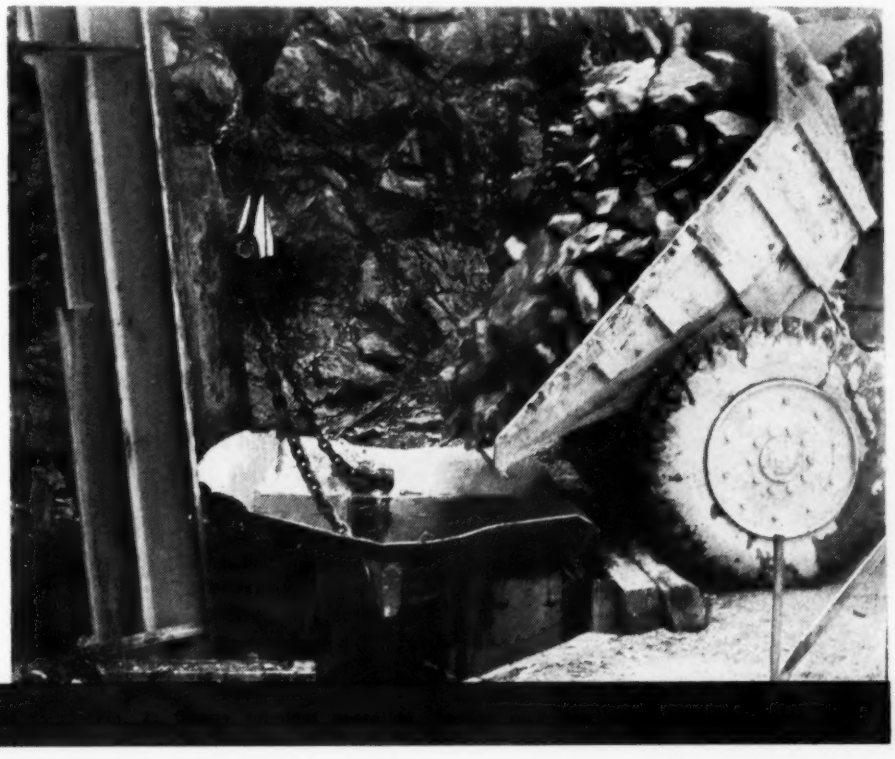
Revised Quarry Practice

Upon completion of the new installation, deep hole well drilling was discontinued in favor of shallow face operation. Drilling is now accomplished by means of an Ingersoll-Rand Type GM15 wagon drill. Fragmentation is excellent and very little secondary blasting is required.

Where men and mules formerly worked out the kiln stone and spalls, a new Marion Type 362 diesel shovel with 1½-cu. yd. bucket now loads the quarry run rock to two Koehring-Dumptors in a highly satisfactory manner as shown in Fig. 1.

Enlargement of the small portal through the pillar under the county road provides for free passage of the shovel and mobile equipment between the north and south quarries.

At the quarry terminal the Dumptors discharge quarry run rock into a specially designed box capable of



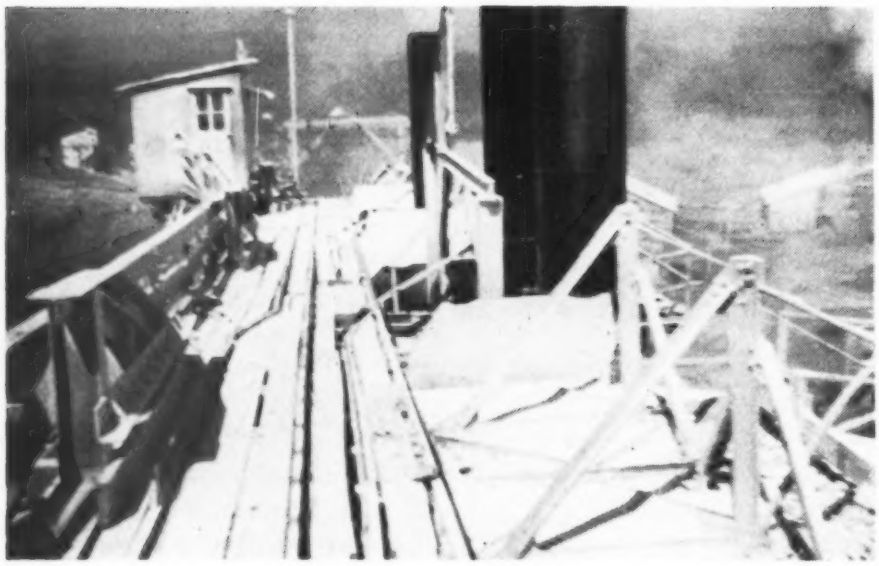


Fig. 6: Car dumping and kiln top opening facilities viewed from No. 3 kiln

holding one full load. The box is readily positioned by means of a guide placed adjacent to the hanging wall. The top of the box is at quarry floor level to facilitate loading with a minimum of spillage.

The quarry terminal is so designed that it can be maintained in proper relation to the quarry floor when the bottom is taken up. Fig. 2 shows the box being loaded at the quarry terminal.

An American stiffleg derrick with a 46-ft. mast and an 80-ft. boom hoists the box from the quarry terminal and swings it through an arc of approximately 135-deg. to its dumping position on a rack about 165-ft. above the quarry floor in a little more than one minute. An auxiliary dumping rack is provided so that mud and quarry refuse can be diverted to trucks on the upper level. Fig. 3 shows the hoist beginning the swing which will bring the rock box to the dumping rack shown in Fig. 4.

The hoist is provided with elaborate controls and a signal system between the upper and lower workings. The hoist controls are strategically located in a control tower close to the dumping rack so that the operator can exercise close control over the entire operation.

The stone box releases its contents through bottom doors to a 42- x 90-in. McLanahan and Stone reciprocating plate feeder which controls the rate of flow .of material to the Traylor 36- x 42-in. jaw crusher where a reduction to minus 8-in. is effected.

The run of the crusher at minus 8-in. is carried by a 30-in. belt conveyor, 361-ft. centers, to a screen house located above the storage bins. The conveyor monitor is roofed and provision has been made for future installation of siding and windows if and when necessity requires them.

In the screen house a Tyler 5- x 8-ft. single deck Type F-600 Ty-Rock screen provides for a separation at 3-in. Fines are transported by a short 20-in. cross conveyor to a 20-in. shuttle conveyor, 60-ft. centers, for distribution in their designated areas in the storage bins. The kiln stone, plus 3-in. minus 8-in. passes directly from the screen to a 30-in. shuttle conveyor, 56-ft. centers, for similar distribution.

Fig. 5 shows a view of the crusher house, screen house, conveying system and rock storage bins. The control tower can be seen at the upper right of the crusher house.

Stone Storage and Recovery

The stone storage bin is 40- x 120-ft. with an interior wall 14-ft. in height providing for positive segrega-

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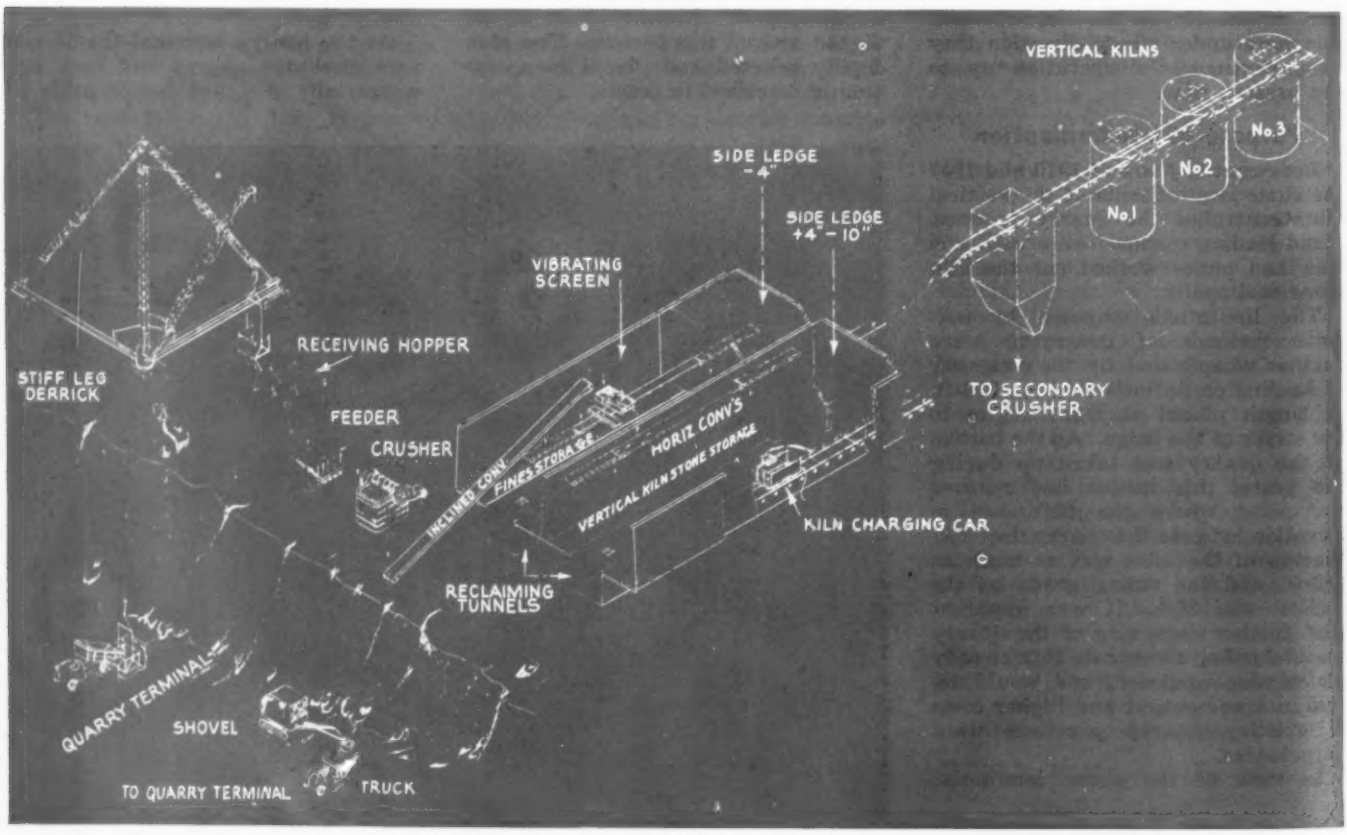

Fig. 7: Schematic flow diagram showing layout of plant facilities and storage

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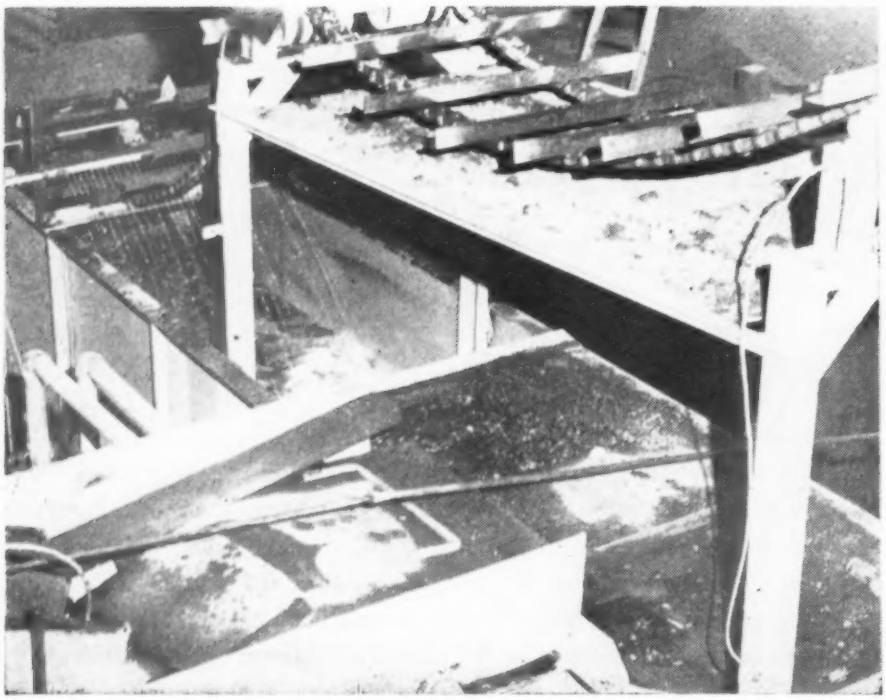
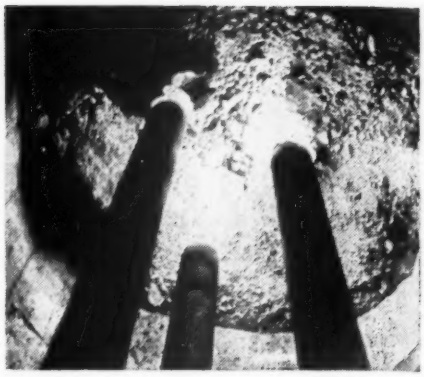


Spray of water, left, washes granules which cling to conveyor flights. In the foreground is tapping bar which is pulled to start molten flow. View taken during the 5-min. period between taps



Looking down into furnace, showing top of cold charge and the three 6-in. graphite electrodes which melt the rock at about 1500 deg. C., utilizing 180 volts at 5000 amp.

Magnesium Products, Inc., Seattle, Wash., producing calcium magnesium phosphate for fertilizer industry by new process

ELECTRIC FURNACE

Combines Olivine and Phosphate

By W. J. GRANBERG

To meet an insatiable demand for fertilizer, calcium magnesium phosphate is now being produced in the new Seattle, Wash., plant of Magnesium Products, Inc. Olivine and phosphate rock are combined in an electric furnace, drawn off in a molten stream and quenched quickly with cold water to form granules in a form available to plant life.

Phosphate rock is obtained from the company's own mines in Flint Creek Valley, near Phillipsburg, Mont., while the olivine is found on Cypress Island, near Anacortes, Wash. From storage bunkers at the Seattle plant, the rock is measured out to the proportion of two parts phosphate to one part olivine. The rock moves into the plant storage bins on a 20-in. belt conveyor, and is carried to the furnace by an overhead crane in skip boxes which have a capacity of 2½ tons.

Granules of phosphate-olivine are carried up an incline by conveyor which permits water to drain off. It is then dropped below for conveying by belt to oil-fired rotary dryer

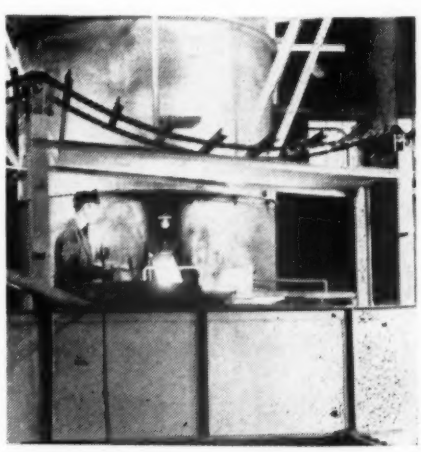
Electric Furnace Operation

The furnace is a converted Greene electric steel blast furnace which now stands 10 ft. high, with a diameter of 5 ft. 7 in. inside the lining of fire brick. Although it has a capacity of 10 tons of rock, experiments have indicated the furnace operates at its best under half a charge, since gas pockets form when the furnace is filled to capacity. Also, a cold charge above the melting rock is maintained to prevent the loss of phosphate by reduction.

Melting of the rock is accomplished by three 6-in. graphite electrodes which maintain a heat of 1500 to 1600 deg. C., operating under 180 volts at 5000 amp. A charge takes about two hours to go through the furnace, with each ton of rock producing about nine-tenths of a ton of phosphate fertilizer. Each tapping of the furnace to draw off the molten rock occupies about 30 minutes, with a five-minute interval between each tap.

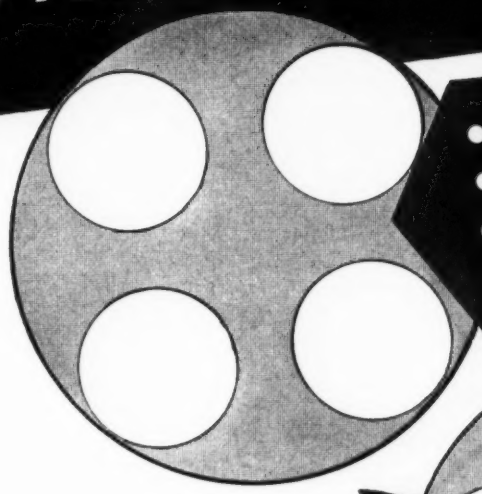
As the molten rock flows from the furnace it is quenched quickly by 11 jets of cold water directed at the flow from two directions, seven nozzles striking it from below and four nozzles from the opposite direction. Rapid cooling is essential in order to convert the rock to calcium magnesium phosphate granules which is available to plant life. Normal cooling would re-

(Continued on page 110)

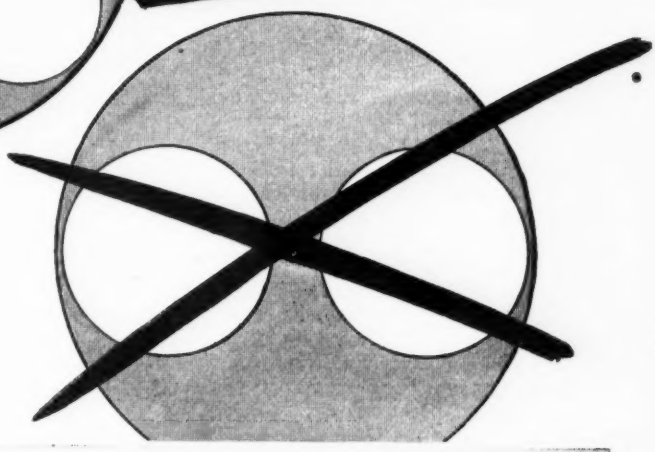


Electric furnace from which molten rock passes to quenching box. Chain conveyor equipped with scrapers picks up granules from bottom of box

Why is it better to have 4 VALVES PER CYLINDER?



- MORE POWER
- GREATER BREATHING CAPACITY
- LOWER VALVE TEMPERATURES
- LONGER VALVE LIFE



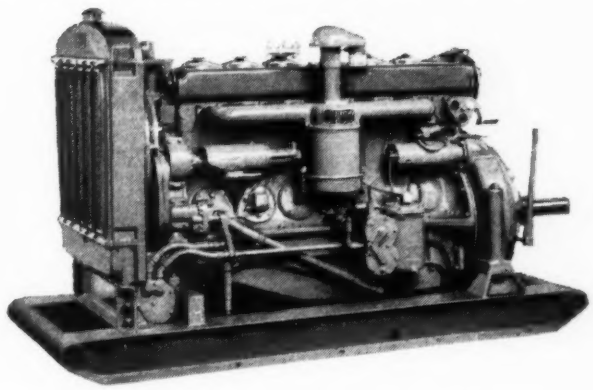
the MURPHY DIESEL has 4 valves per cylinder

Comparing Murphy Diesel 4 valve design with the conventional two valve design of equal total valve area, you will see that the 4 valve arrangement provides 41.4% more circumference. *Since virtually all valve heat is dissipated through the metal to metal contact area of the seat, 4 valve design offers 41.4% more area for heat dissipation.* Likewise, 4 valve design means escaping heat has a shorter distance to travel . . . with equal valve lift 4 valve design provides 41.4% greater port area for intake and exhaust breathing. For Murphy Diesel owners it all adds up to higher power output and better all-around performance and explains why Murphy valves rarely, if ever, have to be ground.

Get full details from your Murphy Diesel Dealer and ask for a copy of the booklet *"7 Questions to Ask a Diesel Engine Salesman."*

MURPHY DIESEL COMPANY
5315 W. Burnham St., Milwaukee 14, Wis.

Above—This 150 H.P. continuous, 180 H.P. intermittent, Murphy Diesel powers a rock crusher owned by Gallagher and Nelson, Madison, Wis.



Murphy Heavy Duty "True" Diesel Engines and Power Units, 90 to 190 H.P., Generator Sets, 60 to 116 K.W., A.C. or D.C.

LOWEST ULTIMATE POWER COST

MURPHY DIESEL

Phosphate Fertilizer

(Continued from page 108)

store the rock to its original form, which plants cannot absorb. Granule size is determined by the speed of cooling the rock once it has left the furnace. In the case of the Seattle plant, cooling, or quenching is done immediately adjacent to the furnace and a minus 20-mesh product is the result. Were the rock allowed to flow any distance before being quenched, the resultant granules would be coarser.

A conveyor chain, mounting angle irons, scrapes the calcium magnesium phosphate from the bottom of the quenching tank and dumps it on a wire mesh conveyor belt where much of the water is drained off. Conveyed by a belt to an oil-fired dryer which completes drying, the phosphate moves by belt again to an Eimco ball mill where the granules are reduced to a minus 100-mesh.

The Seattle plant is now producing 50 tons per 24-hour operation with one furnace. Plans call for installation of a second furnace later this year which will have a capacity of 200 tons per 24-hour day, with a third furnace going in next year of similar capacity. John R. Allen is president of the company. R. C. Grant is plant and production manager, with Cyrus W. Richardson the plant superintendent. The Seattle plant is the only one of its kind in the Pacific Northwest, and the second one in the nation.

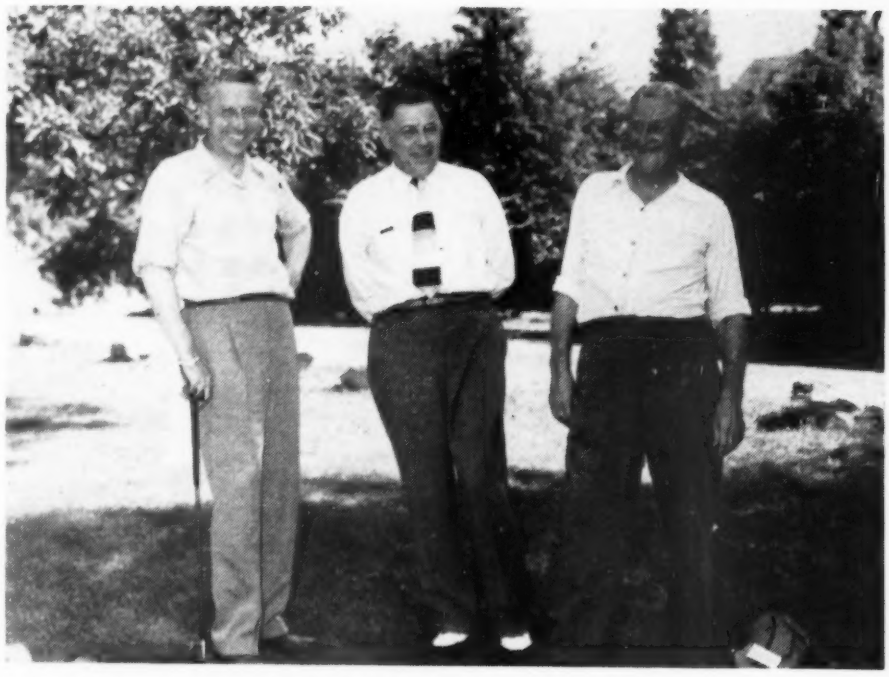
Propose State Cement Unit

A PROPOSAL to establish state-owned projects for supplying cement and perhaps other essential road-building materials to the state and its political subdivisions at production cost is being put into shape for lawmaker consideration in Kansas, a report states. The purpose of the projects would be to lower high material costs, thus aiding highway programs.

The proposal is for the state to acquire cement lands and to install its own production equipment, using inmates of state penal institutions as employees. Success of the South Dakota state-owned and operated cement plant is being cited as a supporting factor in the proposal.

Mine Cage Safety

DEVELOPMENT of a device to stop falling mine cages and finding a practical method for determining a dangerously worn cable, are of equal and utmost importance in the mining industry today, according to James Boyd, director of the Bureau of Mines. A recently released report, "Safety Catches on Mine Cages and Methods of Testing Them," describes the problem, state laws governing same, and gives particulars of some recent mine accidents. This report may be had by writing the Bureau of Mines, Pittsburgh 13, Penn., referring to Information Circular No. 7436.



Left to right: State Senator Geo. Wade, Camp Hill; H. H. Wagner, general manager, Pennsylvania Stone Producers Association, and E. L. Schmidt, Chief Engineer, Pennsylvania Department of Highways

Pennsylvania Stone Producers Annual Outing

PENNSYLVANIA STONE PRODUCERS and the Agricultural Limestone Division held their annual outing at the Carlisle Country Club on August 26.

A. E. O'Brien, executive secretary, Associated Pennsylvania Constructors, Harrisburg; and John Rice, Jr., vice-president, General Crushed Stone Co., Easton

No business meetings were held. A golf match was the outstanding sports event. Mr. Fink of the H. E. Millard Lime & Stone Co., Annville, Penn., took first prize, and Elgin Wood, Harrisburg, copped the second prize. About 400 stone producers, highway officials, and equipment manufacturers were in attendance.

Record Phosphate Shipment

HOOVER & MASON PHOSPHATE CO., Mt. Pleasant, Tenn., recently broke two world's records with a single shipment of 51 carloads of ground phosphate rock for use in Jersey County, Ill. The shipment, totaling 2100 tons, was said to be the largest single shipment of ground phosphate for direct application to the soil, and also represented the largest single order for use in a single county.

New Equipment for Ore Separation

THREE new types of dry-concentrating equipment developed by the Bureau of Mines for separating ores not amenable to ordinary ore-dressing treatments are described in a new publication issued by the Bureau. The publication covers structure and operation of each of the new concentrating machines, and points out that they have been successfully employed on an experimental scale in the separation of such minerals as vermiculite, graphite, molybdenum, kyanite, and chromite. Free copies of "Report of Investigations 4286—New Dry Concentrating Equipment" may be obtained from the Publications Section of the Bureau, 4800 Forbes St., Pittsburgh 13, Penn.

Relate Quarry History

HISTORY of the first quarry operated by the France Stone Co., located at Bloomville, Ohio, is given in the Anniversary Issue of "The Conveyor," a company publication. Included in the article are pictures of Enoch H. France, founder of the company; the first crew of workmen; and a group of old-time employees; plus an excerpt from the Bloomville paper printed sixty-seven years ago covering the company's founding.

SLY DUST CONTROL

Dominates IN THE CEMENT INDUSTRY— AND THROUGHOUT THE ROCK PRODUCTS FIELD

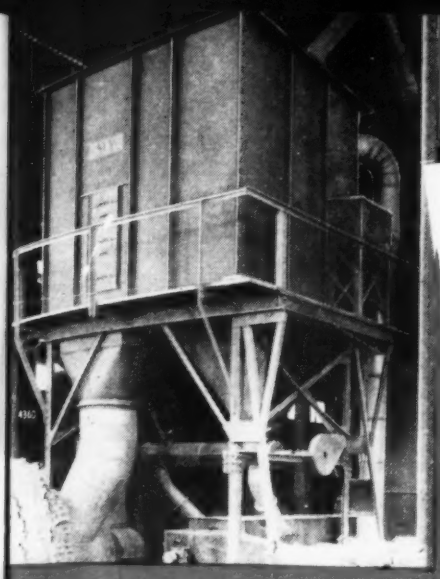
IN the cement mills of United States and Canada, also South America and Australia, there are more Sly Dust Filters, by far, than any other make (estimated at four times as many as the next most popular make).

These filters collect fine dust that would otherwise be scattered over everything and everybody. They protect workmen and eliminate dust wear on machinery bearings and gears.

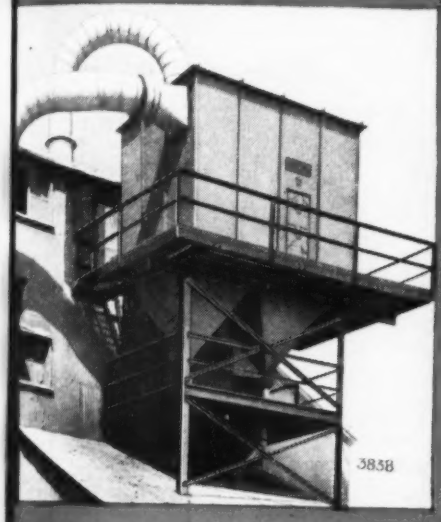
Sly Dust Filters offer exclusive advantages: greater filtering capacity, power savings, automatic control, and savings in maintenance and operation. They soon repay their cost.

Write us fully so that we may analyze your problem and tell you exactly what can be accomplished.

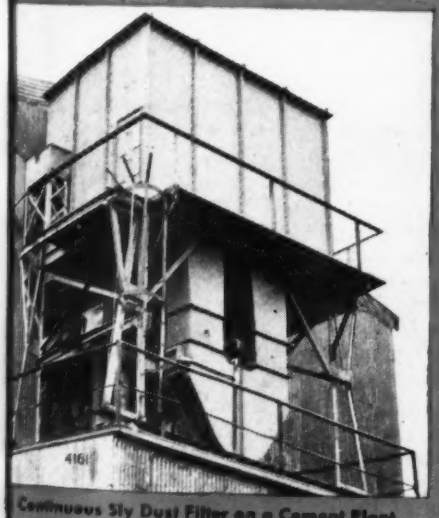
THE W. W. SLY MFG. CO.
Cleveland 2, Ohio
4746 Train Avenue



Sly Dust Filter in a Cement Plant Bag House

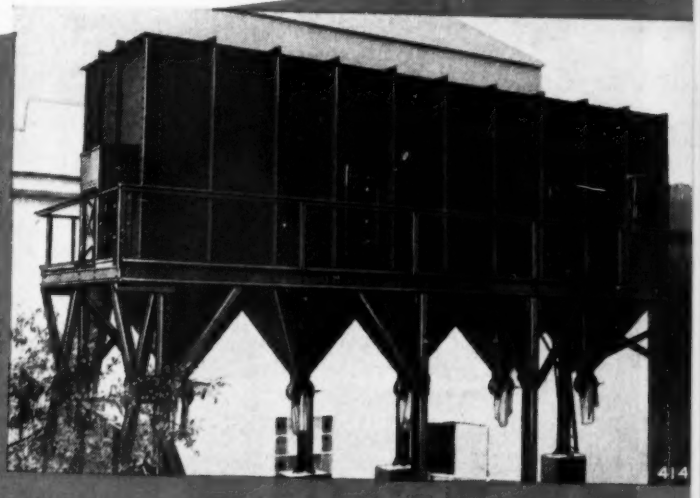


One of several Sly Dust Filters on a Cement Plant Pack House.

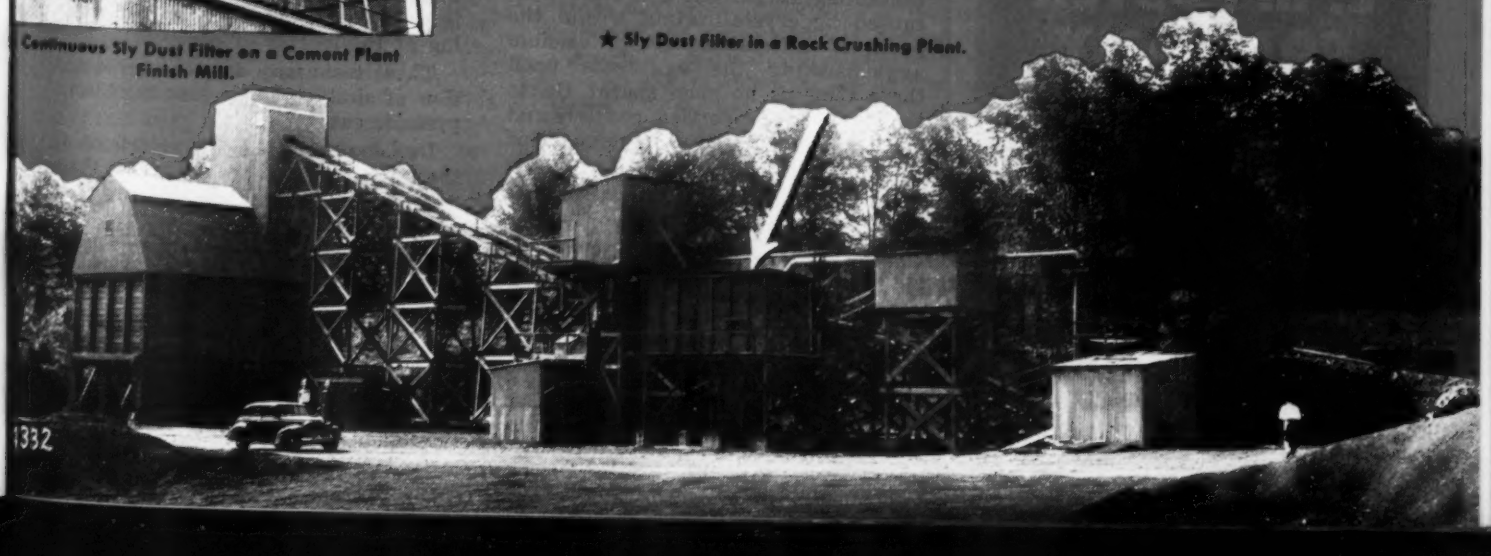


Continuous Sly Dust Filter on a Cement Plant Finish Mill.

★ Sly Dust Filter in a Feldspar Quarry and Mill.



★ Sly Dust Filter in a Rock Crushing Plant.



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Five convenient warehouses for prompt delivery
WRITE FOR FOLDER No. F-101

Chemist Corner

(Continued from page 95)

1919), by P. H. Peeters and A. A. Klein." Their results are reported in Table 1. All mixtures contain 1.65 percent SO_3, except No. 2, containing 5.5 percent. The reader considering neat cement results will notice that No. 2 is already affected betwen 7 and 28 days. No. 3 (C_3S) and No. 5 ($C_3S + C_3A$) shows a decrease after 28 days.

Table 1 (kgs/sq.cm.

Constituents	Res. 200 Mesh Percent	Neat Cement After 1d.	7d.	28d.	3m.	6m.	12m.	1-3 Mortar After 7d.	28d.	6m.	12m.
1-C_2S	13.6	–	–	98	538	616	718	–	23	194	225
2-C_3A	14.4	100	135	125	–	–	–	–	–	–	–
3-C_3S	15.2	440	698	772	683	657	642	270	407	371	–
4-81C_2S+19C_3A	—	98	105	192	376	380	614	40	58	260	387
5-81C_2S+19C_3A	—	267	665	908	562	551	603	330	395	356	–
6-50C_2S+50C_3S	—	166	362	527	670	576	778	119	220	320	–
7-40.5 C_2S+ 40.5 C_3S+ 19.-C_3A	—	307	432	671	681	671	803	198	247	335	–

Similar conclusions result from a study of Table 2, prepared by *Tagung des Vereins Deutscher Portland Zement Fabrikanten*, March 16, 1932, by Prof. D. A. Guttman and Dr. Gille (page 204, Zement 1944). Only part of this extended original table is given.

Table 2: Total tensile strength 7 +28 days, 1-3 mortar compared to C_3S =100 Percent and given in percent

Compiled by	Sand and Gypsum	C_3S	C_3S+ 3% Gypsum	0.80 C_3S + 0.20 C_3S	0.75 C_3S + 0.25 C_3S
Bates 1917	Ottawa 0% gypsum	100		150	
Haegermann 1931/1932	German 0% gypsum	100			178
Bates 1917	Ottawa 3% gypsum		100	107	
Spohn 1932	Micro-Kuhl 3% gypsum		100	108	

Here the admixture of 3 percent gypsum (1.5 SO_3) to the mixes of $C_3S + C_3A$ diminishes the total mortar tensile strength from 150 percent and 178 percent, back to 107 percent and 108 percent.

The curves and tables all seem to point out that even 3 percent of gypsum in the presence of C_3A and C_3S is prejudicial within 28 days. The question is worth repeating: Is not the parallel increase in tension and compression of portland cement, containing 12 percent and more C_3A, caused by crystallization within the pores of sulfo-aluminate of calcium agglomerating the aggregate until there remains no open space? Up to that optimum proportion, concrete and mortar seem to gain in value. But once that limit is crossed, inner compression still reacts against outer mechanical pressure applied for the test, but the tensile strength betrays expansion. With as much as one more percent of gypsum the disintegration expresses itself in both. Mortar rapidly crumbles to pieces or dust.

If 28 days only elapse in this case, with 6 percent of gypsum, does not the same danger exist with 2 or 3 percent after a few months or years, or in another agglomerate, where voids have been previously filled up by "technically classified" gravel and sand, vibration, fines and cement, replacing water which dries out? Do we not adorn potential destructive forces with the label "improvements?"

With high resistance and quick-hardening obtained through an increase in C_3S and C_3A, fine grinding calls for additional SO_3 to compensate solubility loss of anhydrite, air elutriation (or sweeping) and classification removing the larger particles that constitute a reserve for healing later cracks, heat and steam-curing with their additional stresses; are these factors not so many errors?

All this can be positively cleared up by a methodic program of laboratory tests, for description of which I shall be glad to help, but available space is lacking. These tests are expected to lead to the easily made Ferrari type cements, air-quenched cooling, another setting regulator for normal portland cements and reconsideration of many concrete practices.

I suggest extensive concrete tensile tests, observed not only over 28 days, but months and years, until a process is worked out enabling artificial ageing of the mortar or concrete.

These tests may do more for detection of destructive agents than compression curves.

I apologize for perplexing friends in the cement industry and wish these questions could be cleared up.

In every plant, the manufacturing process can be easily altered without considerable expense. It is advisable though for new plants to keep in mind that some changes in choice of material may soon be in use.

Sink-Float Process

(Continued from page 103)

Magnets used to recover the media washed from the sink and float portions were in all cases Crockett-type, continuous magnets supplied by Dings Magnetic Separator Co., and were practically all the 12-in. size. This magnet is simply incorporated with a short, continuous rubber belt possibly 12-ft. center to center. It operates wet in a tank not unlike an ordinary sand drag. The heavy magnet is close to the lower and up-going part of the belt. Magnetic material is influenced through the belt and carried upward away from the magnetic field where the ferro-silicon drops and passes to the "densifier" for storage purposes. The magnet uses about 3-hp. and is a fool-proof machine. One plant, using a 14-ft. cone, had two of these units but soon found that one was sufficient and shut down the second.

Wash waters and ferro-silicon going to these magnetic separators in the larger installations were first sent to a small diameter, Dorr-type thickener. In these cases the fluid passed between magnetizing blocks that flocculated the ferro-silicon so it would settle in the thickener. These magnets are stationary and use about one-half horsepower. The underflow from the thickener is pumped to the magnetic separator and the overflow (mostly water) is pumped back to the washing screens and re-used. In the smaller plants there was no provision for thickening ahead of the magnetic separator with no apparent ill effect.

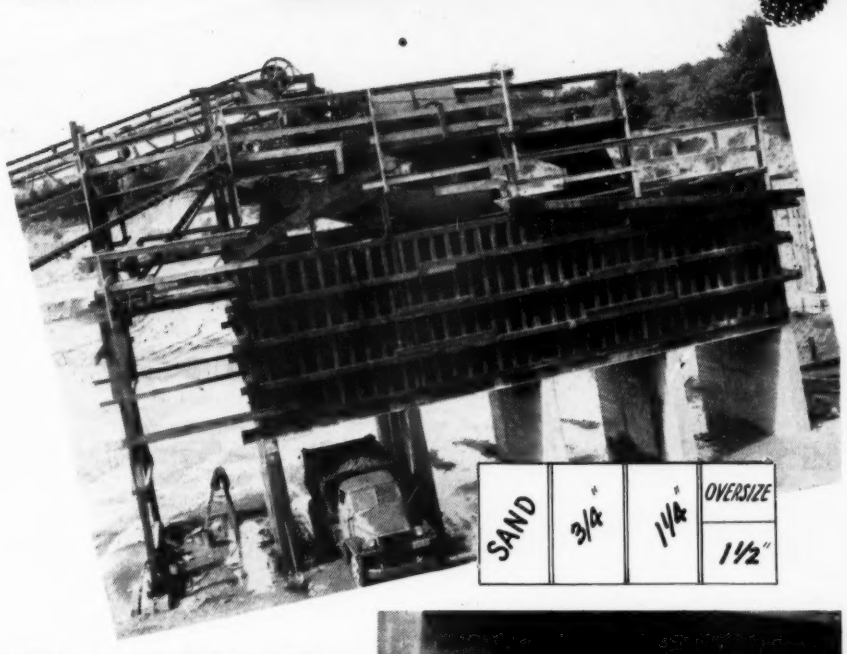
One should not be confused for, as described, in the larger installations there are three magnetic devices. Two are stationary, coil-type magnets, and the "Magnetic Separator" is a continuous, belt-type device. All are extremely simple in design and operation.

Wash water and ferro-silicon going to the magnetic separators carry along some fine sand not removed prior to the treatment in the separatory cone, or sand that has been made by attrition in the subsequent handlings. These sands, which settle in the tank holding the belt-magnet, normally go to waste through a suitable valve outlet. This water is the only liquid to leave the plant and can usually be drawn off in a one-inch pipe line. In one case these sands were being pumped to an Akins spiral dewaterer outside the plant, and the recovered fines blended with the valued portion of the plant's output. This plant used a small Denver diaphragm pump for this purpose and was treating fluorspar.

As we indicated at the outset, recovery of the media is an important part of the process and accounts for much of the equipment used. The sink and the float portions from the separatory cone pass down the washing,

(Continued on page 118)

In This Compact New York Set-up



EAGLE

- **WASHES**
- **CLASSIFIES**
- **DEHYDRATES**

Fine Material

They don't come much neater than this arrangement of a rotary screen and Eagle Washer-Classifier-Dehydrator over the loading bin compartments at the I. Pshonick & Son plant at Liberty, N. Y. The sand from the Eagle and the four classifications of stone from the screen follow the shortest possible route to their respective compartments.

Different grades of sand are obtained by excavating various veins in the pit and by varying the amount of water, speed of the Eagle, and length of adjustable weir. Note how the material is piped right to the built-in Eagle feed box in the lower view. This assures the exact point of feed-in for top results and has a baffle to prevent turbulence. The U-shaped weir with adjustable lips assures precise classification control. The rising column of water under the tumbling action of the conveyor screw floats out all trash and excess fines. Get the details in Catalog 47.

SINCE 1872
Progress...Service

Sand and Gravel Equipment

"SWINTEK" DREDGE LADDERS — SCREW WASHERS
LOG WASHERS — DEHYDRATORS — SAND TANKS
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ELIMINATE

Feed Rate Variation

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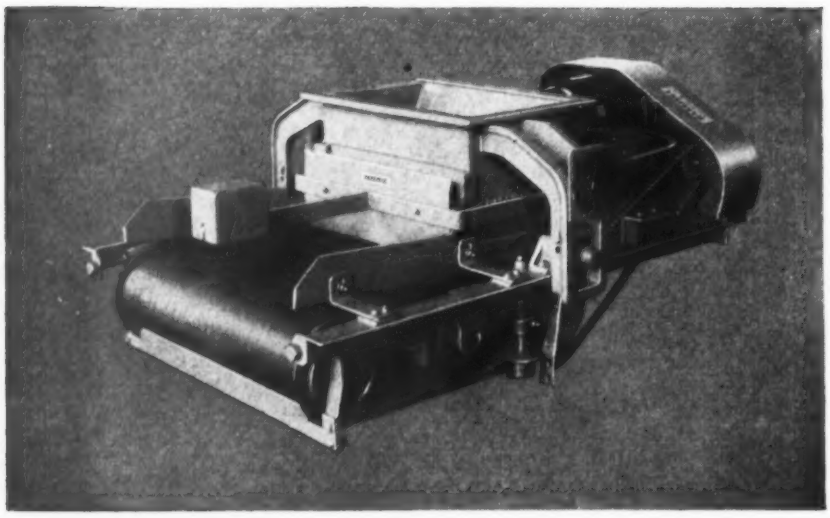


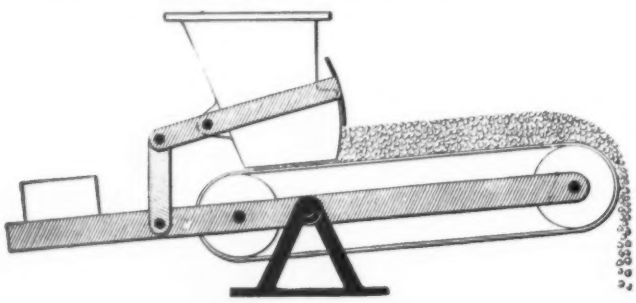
HARDINGE Constant-Weight Feeder

If you are troubled by feed rate fluctuation — study the diagram below carefully.

It shows the operating principle of the Hardinge CONSTANT-WEIGHT Feeder.

The weight on the left counterbalances the moving feed on the belt at the right. If the feed density changes, the balance is disturbed and the feed gate opening increases or decreases to compensate.

Thus a constant-weight rate of feed is maintained, even though the volume rate (c.f.m.) and size of feed may vary.



For applications where weight control is not essential, Hardinge also builds Disc Feeders, Volumetric Belt Feeders, and Volumetric Non-Flooding Drum Feeders. Write for Bulletin 33-D which describes the complete line of Hardinge Feeders.

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CONICAL MILLS | COUNTER CURRENT CLASSIFIERS | THICKENERS CLARIFIERS | RUGGLES COLES DRYERS | CONSTANT WEIGHT FEEDERS | TUBE ROD AND BATCH MILLS

Sink-Float Process

(Continued from page 117)

(vibrating) screen, which uses 10- to 14-mesh wire cloth all the way. These can be two separate screens (in series) or one long screen. In case two screens are used in series, the fines and liquid going through the first screen are simply pumped back to the separatory cone for re-use without any further treatment. The rock going down the second screen, however, is washed liberally with sprays of water (or return water from the thickener ahead of the magnetic separators). This removes the ferro-silicon media from the surface of the rock, be it the sink or the float portion. This water then flows to the thickener and then to the belt-magnet and from there to the "densifier." In the small plants a thickener is not used.

The densifier, in all cases, was a Wemco, spiral classifier exactly in appearance to the spirals used for sand dewatering, etc. The lower end of this spiral can be easily raised or lowered and the r.p.m. of the spiral can be increased or decreased at will. The ferro-silicon from the magnet flows to this device where it is spiralled back into the system. Or the lower end can be raised slightly and the material stored in the lower end of the spiral's hopper. Before the ferro-silicon from the magnetic separators can be returned to the system it must first go through one more simple step and that is to pass it through the "de-magnetizing coils." This is a stationary type magnet and such a small item that it might well be overlooked. The 2-in. pipe line carrying the ferro-silicon simply goes through the center of the coils and then on to the separatory cone. Its purpose? The ferro-silicon on passing through the magnetic separator loses its property of not settling. It is "flocculated," in other words. The demagnetizing coil simply restores the media to its original state, that is deflocculated, and returns to it the property of *not* settling.

The flow sheets appended show the

Loading fluorspar from a sink-float plant

details of one of the larger installations where a 10-ft. cone was used, and the second flow diagram shows a typical flow sheet of one of the smaller "Mobil Mills," or semi-portable types.

We have purposely "slanted" this article to the gravel operator who may have coal, clay-balls, waterlogged wood, or similar deleterious materials. Its practicability here is attested to by the fact that U. S. Engineers who are in charge of building some of the proposed dams on the Missouri river control project are said to have carried out large scale tests on South Dakota gravels to remove manganese-bearing rock from the gravel. However, the industrial minerals operator who may sense a use for the process in his plant should bear in mind that to make a separation of one mineral component from another, the minerals must be: (1) coarse, and (2) separable by simple crushing operations. One plant, not in operation, had difficulty with the process because the minerals making up the ore were too fine grained to be liberated on a coarse crushing operation, according to reports. For industrial mineral operators it should be looked upon as a continuous cheaply operated sorting operation replacing hand labor.

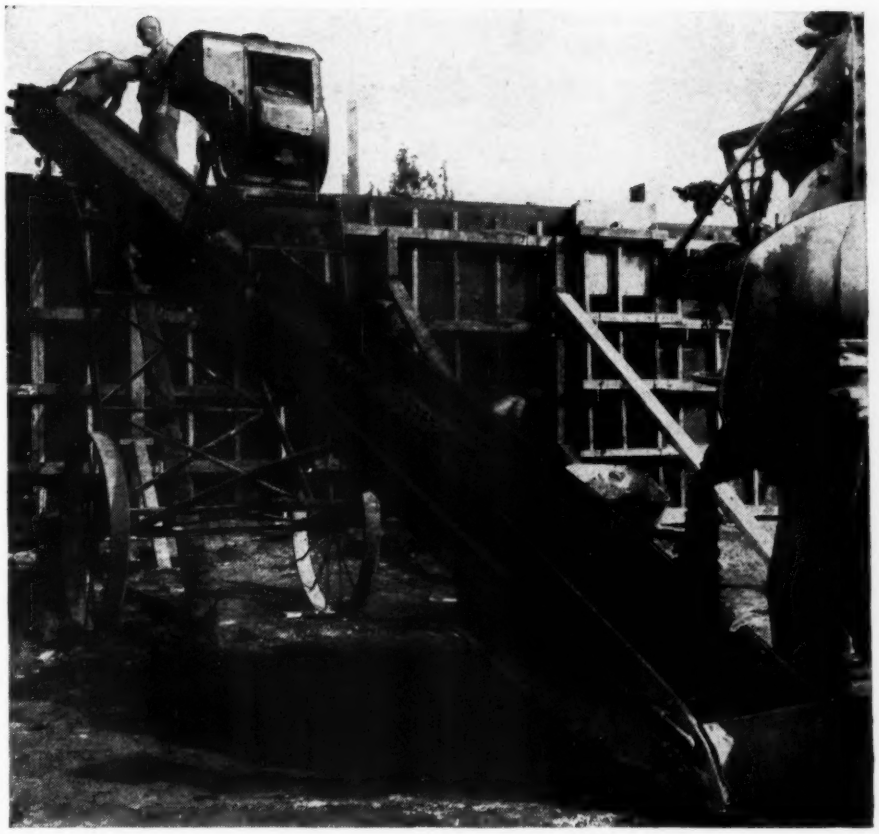
It permits mining lower grade material and reduces the need for so-called selective mining. In the fluorspar field it produces metallurgical and ceramic grades direct and increases the CaF_2 heads going to flotation. The recoveries here are in the 97.98 per cent range with tails running around 5 per cent.

Asbestos Deposits Needed

NO NEW ASBESTOS DEPOSITS have been located in 15 years, with the exception of certain deposits in Africa, according to a paper presented to the American Institute of Mining and Metallurgical Engineers by M. J. Messel, which fact, combined with the postwar expansion and failure to find a suitable synthetic substitute, has created a shortage of the material that has forced the utilization of shorter fibres. Mill tailings are being cleaned by air separation to recover short fibres and old tailings dumps may soon be reworked.

Finish for Asbestos Sidings

"SHINGLE-SEAL," a new product developed exclusively as a decorative, weatherproof finish for asbestos siding and shingles, has been announced by the Dewatex Manufacturing Corp., New York. The product is recommended for painting, preserving, protecting and decorating asbestos siding and shingles, both old and new, exterior and interior; and is claimed to be resistant to atmospheric conditions. No priming is necessary, the finish is available in three colors, and can be applied by brush or spray.



Farquhar Trough Conveyor
"PAYS FOR ITSELF"

handling wet concrete from mixer to forms

ON one job alone, handling wet concrete from mixer to forms, this Farquhar Trough Conveyor — Model 343 — more than *paid for itself* in time and labor saved. No hoist operator was needed; scaffolding was eliminated on this construction project . . . the Farquhar Conveyor fed concrete to the forms at the rate of one cubic yard a minute—faster than the contractor believed was possible.

For All Handling Jobs

General-utility Farquhar Trough Conveyors handle sharp or abrasive materials, fine or powdery materials, small bags or bundles *faster, better, cheaper* than old-fashioned handling methods. Contractors, chemical plants, coal yards, warehouses—all industries turn to Farquhar for the right answers to specific handling problems. Farquhar offers a complete line of conveyors for portable, semi-permanent or permanent use, handling all kinds of loose or packaged materials. Tell us your problem—we have the know-how to help you. Write A. B. Farquhar Co., Conveyor Division, 236 Duke St., York Pa., or 628-A W. Elm St., Chicago 10, Ill.

MOVING DIRT *from basement excavation direct to dump truck with gas engine-driven Farquhar 334-T Conveyor saves time for contractor . . . hard, back-breaking work for men.*

Farquhar PORTABLE OR PERMANENT MATERIALS HANDLING **CONVEYORS**

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It's **NAYLOR** *Light-weight* **PIPE**

and **NAYLOR** *Wedge-Lock Couplings*

Here's the ideal combination for permanent or temporary lines in mining service—a light-weight pipe that can be used for either high or low pressure, plus a remarkably simple and positive coupling that saves time, work and money in pipe line installation. No other light-weight pipe provides the practical and economical advantages of this Naylor combination.

Naylor

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Labor Relations

(Continued from page 77)

holiday pay, which was not for any work performed on that day, would not have to be included in computing overtime. The F.L.S.A. administrator has ruled in several published opinions that holiday pay received by all employes for hours *not worked* can not be used in computing *overtime hours*. So while there has as yet been no judicial determination of the legality of this method of meeting the issue, there is reason to believe it is sound. In any event, this does express, probably, the intention of many contract clauses which rather loosely provided for double-time on holidays.

Other recent changes in contracts provide that the double-time or time-and-one-half rates shall apply only to those who have worked 40 hours or more in the week prior to the Saturday, Sunday or holiday, and that it is specifically an overtime rate. The same contract has a separate clause to take care of employes who have less than 40 hours' work but are entitled to the time-and-one-half or double-time rate for Saturday, Sunday or holiday work. There is no problem in connection with their wages, for the "pyramiding" occurs only when the question of *overtime rate* is raised.

Affecting Interstate Commerce?

This column has called attention before to the interest producers in our industry must take in the application of the Labor-Management Relations Act (Taft-Hartley) to a construction materials business which is essentially local. The general counsel of the National Labor Relations Board has stated on several occasions that the National Labor Relations Act and its amendment, the L.-M.R.A., have much broader application than the F.L.S.A. (Wage-and-Hour Law) because they are worded to apply to all employes in industries, or businesses, which *affect* interstate commerce. Under his interpretation, cases have been brought before the Board and the courts, involving labor controversies in local building trades. (See this column in ROCK PRODUCTS, June, 1948, p. 125).

The latest case of particular interest to our readers to come to our notice involves a concrete products and ready-mixed concrete producer in Tampa, Fla. It was in regard to a petition for collective bargaining between the Tampa Sand and Material Co. and the United Stone and Allied Products Workers of America (C.I.-O.). The N.L.R.B. decided it would "not effectuate the policies of the Act to assert jurisdiction in this case," and the labor union petition was accordingly dismissed. The Board found that this producer did more than $1,000,000 a year business, including purchases of cement, sand, gravel and slag from outside the state, and made some small percentage of deliveries

of concrete products beyond state lines. Nevertheless, the Board decided as above, that this business was too local in character to justify its intervention, however, "without deciding whether or not these operations affect interstate commerce within the meaning of the Act." This was one of several such cases (in other industries) decided in a similar manner in the last few weeks.

Modernize Lime Plant

(Continued from page 106)

tion of the two sizes of stone. As the east end of both bins is further subdivided by a cross wall, side ledge stone may be segregated and handled separately. Although the stone bins have not yet been covered, provision has been made so that roofing can be installed if desired.

A 4-cu. yd. Granby type car operates in the reclaiming tunnels which run for the full length of the storage bins. The spalls are drawn off through six angle-of-repose chutes at a high rate of speed and hoisted to the commercial crusher hopper where they are discharged by the fifth wheel principle to the crushing, sizing, and storage facilities.

Kiln stone is reclaimed from storage by means of six Stephens-Adamson 36- x 42-in. Moore type bin gates. Operation of these gates proved unsatisfactory from the point of view of labor requirements since two men are needed for their successful operation. Kiln stone is hoisted in the same way as the spalls and automatically discharged to each of the three large gas-fired kilns. The second hoist operator not only controls the movement of the car to the crushing plant and the kilns, but also operates the charging doors which are actuated by compressed air with controls in the hoist house. The switching arrangement on the top of the kilns which provides for selective dumping of the cars is shown in Fig. 6. A schematic flow diagram of the entire operation is provided in Fig. 7.

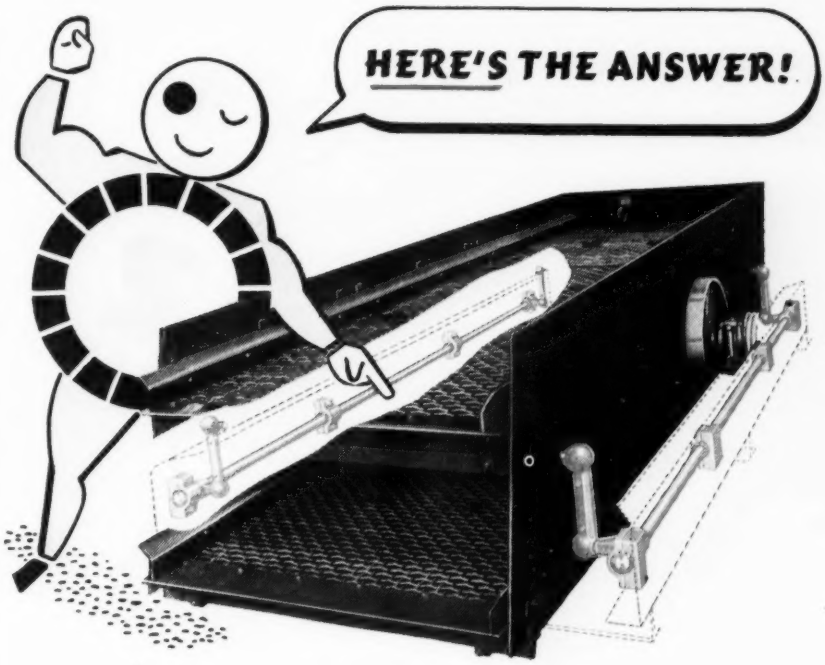
The entire project was undertaken and carried to successful completion during a period when construction material and equipment were in extremely short supply. E. S. Guth, vice-president in charge of operations of the North American Cement Corporation, was the guiding influence in the development, but the work was done under the immediate direction of S. L. Greenawalt, chief engineer. E. F. Alderton, who has been works manager at the Berkeley plant for many years, participated actively in the project and has expressed his gratification of the results achieved. Engineering and detailed design was supplied by L. I. M. E., consulting engineers, Hershey, Pa.

New Storage Facilities

LEHIGH PORTLAND CEMENT CO. has filed plans with the city to erect storage facilities in Buffalo, N. Y.

WHY!

more tons per hour with Seco vibrating screens



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This Seco engineering exclusive *connects* the live screen body to the base frame at four points. Result, in operation, is a fully controlled true circular action that pays off in greater screening efficiency. Not only more tons per hour, but smooth, trouble-free performance is yours with a Seco Vibrating Screen. Seco builds over 250 models. Used and preferred on thousands of tough screening jobs coast to coast.

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In Canada: United Steel Corporation, Ltd., Toronto

LIGHTWEIGHT HAYDITE
. . . Another Job For Deister

Carter-Waters Corporation's new haydite plant at New Market, Mo.

One of Carter-Waters' Deister Screens.

Two double-deck Deister Vibrating Screens are handling the entire sizing job at The Carter-Waters Corporation's new haydite plant at New Market, Mo. Daily production of this critically-needed, light-weight aggregate amounts to 320 to 360 cubic yards per day.

The Deister Screens—4′ x 12′ and 4′ x 8′—are operated in series and produce four sizes of haydite, ranging from dust to ½-inch top.

The opposed elliptical throw and positive high speed of Deister Vibrating Screens enable them to do a faster, more accurate sizing job on any type of aggregate—light or heavy.

No matter what your plant produces, Deister Screens will assure you reliable, efficient performance day after day . . . month after month.

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Lime for Air Base Construction

AMONG the interesting facts being brought to light in connection with the vast military air base construction program during the war are those facts concerning construction of Chase Field, Beeville, Texas, where hydrated lime was used to lower the pH of the soil.

As reported in Limeographs, the base course was originally designed as a crushed caliche course with a pH specification of 10 or less. It was soon found that this requirement could not be met with the local caliche material available which had an average pH of 15, and suitable material could not be found within reasonable hauling distance from the field. As a result, it was decided to stabilize the local materials with an additive.

Tests showed that the pH could be lowered most economically to the required level with two to three per cent hydrated lime, which was added to the base material on the runways by mixing with a Woods mixer and compacted with sheepsfoot rollers in standard manner. The original pH, which ranged from 10 to 20, was reduced to an average of 5.

The runways are still in good condition four and one-half years later, according to the report. The base materials averaged 6-in. in thickness with 1 to 2 in. of Uvalde rock asphalt surfacing. The total thickness of this flexible base was 7 to 8 in.

Swedish Lime Production

SKANSKA CEMENT CO., Sweden, recently began operation of a new 100-ton lime plant, which includes two Azbe center burner kilns of 50-ton capacity each in the flow. Using gas-fired kilns, this plant is one of the most completely mechanized in Europe. Additional designs are on order for a kiln to be installed at the Karta and Oaxen plant. Donovan R. E. Werner is technical head of the company.

STOCKHOLMS SUPERFOSFAT FABRICKS will install an Azbe kiln designed for high capacity calcination of small sized stone at its Sundsvall plant in northern Sweden. The large existing kilns are being adapted to the Azbe system as much as possible. Hans Rydin of Stockholm is general director of this company.

UDDEHOLM AKTIEBOLAGET will place an Azbe mixed feed kiln in operation at its Langban plant in the near future for dead burning of dolomite to be used in the production of steel plant refractory linings. Carl Weslien is plant manager at this installation.

DOMNARFVET JERNVERK, division of Stora Kopparberg Corp., will soon install a gas-fired, four-kiln, 200-ton lime plant, in order to meet the increased demand for lime in its expanded steel production. This corporation has been in continuous existence for 600 years.

F.T.C. Hold Over Industry

THE POWER that the Federal Trade Commission can hold over American industry was expressed in a quotation of Federal Trade Commissioner Lowell B. Mason, published in the Louisville, Ky., *Courier-Journal*, June 29, 1948.

According to the item, Commissioner Mason, speaking before the 11th annual membership meeting of the National Small Business Men's Association, said: "Under present law, I guarantee that I can get a cease-and-desist order against any businessman in the country who is engaged in interstate commerce." He said members of the F.T.C. were men of the "highest integrity," but that recent Supreme Court decisions and a faulty system had made the commission a czar. "Present laws with regards commerce are so confusing nobody can tell what he can or cannot do."

Limemeter for Soil Testing

Since development of the limemeter by Merrill Woodruff, instructor in soils at the University of Missouri College of Agriculture, the device is now being used in 37 states for soil testing, and is expected to gain worldwide employment, a report states.

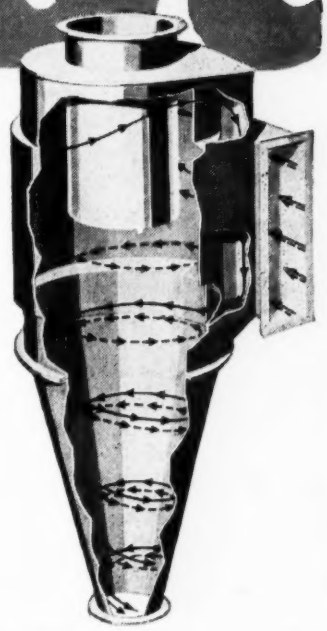
Mr. Woodruff's invention functions on an adaptation of the general principles of electrical impulses that apply in radio and radar, in determining the lime or calcium content of the soil. Previously tests for calcium content have been ones of visibility, i.e., comparing colors. Some error was caused in this method as eyes often see shades differently.

The limemeter is reported to eliminate chance for error. The soil, in solution, is placed in the device and the test result is shown on a gauge in front. Amount of crushed limestone needed to bring the soil to the pH also is shown on the gauge.

Gypsum Plaster Alone And Mixed with Lime

F. PUPIL of the French Laboratory of Buildings and Public Works has observed that gypsum plaster used to be successfully applied some 200 years ago for exterior decoration of buildings in certain parts of France. The secret seemed to have become lost, but he feels that he has now rediscovered it. He recommends mixing the plaster with about 40 per cent of thoroughly hydrated lime to improve its resistance to the solvent and erosive action of rain water. Sodium silicate treatment seems to help this resistance as does magnesium fluosilicate to a less extent. Copper or iron sulfate may be added to produce some coloring. Before painting it is essential that the alkalinity in the lime be neutralized, according to *Revue des materiaux de construction et de travaux publics*, May, 1946.

What to do about dust RECOVERY



Dollars to doughnuts

your attitude on dust collection and recovery is "Show me!" Because the Buell van Tongeren high-efficiency cyclone is so different its promise of better service on your job is important. *First*, only the van Tongeren System has the "Shave-off", which is the pay-off in achieving high fractional efficiencies. *Second*, each Buell unit is engineered to the job for which it is to be built. *Third*, size, shape and proportion give it not only a decided efficiency advantage but an assured freedom from plugging which is most important. The facts are marshalled for easy reading in a new 32 page catalog. Write to: Buell Engineering Company, 2 Cedar Street, Suite 5000, New York 5, N. Y.

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FINANCIAL

RECENT DIVIDENDS

Basic Refractories	$ .10	Sept. 15
Bessemer, Limestone and Cement	1.00	Sept. 10
Bessemer, Limestone and Cement	1.00	Oct. 8
Bessemer, Limestone and Cement pf.	.50	Oct. 1
Bessemer, Limestone and Cement pf.	.50	Jan. 1
Canada Cement, Ltd., pf.	$ .32½	Sept. 1
Canada Crushed Stone, Ltd.	.10	Sept. 20
Colonial Sand	.10	Oct. 2
General Portland Cement	.25	Sept. 30
Industrial Silica Corp.	.16	Sept. 10
Industrial Silica Corp.	.17	Sept. 10
Keystone Portland Cement pf.	3.50	Sept. 30
Lehigh Portland Cement	.75	Dec. 1
National Gypsum Co.	.25	Oct. 1
National Gypsum Co.	1.12½	Sept. 1
Pacific Coast Agg.	.08	Sept. 24
Peerless Cement Corp.	.25	Sept. 16
Penn.-Dixie Cement Corp.	.25	Sept. 15
Penn. Glass Sand Corp.	.40	Oct. 1
Penn. Glass Sand Corp. pf.	1.25	Oct. 1
Santa Cruz Portland Cement	.40	Sept. 15
Standard Phosphate	.60	Sept. 15
U. S. Gypsum Co.	1.50	Oct. 1
U. S. Gypsum Co. q	.75	Oct. 1
U. S. Gypsum Co. pf.	1.75	Oct. 1

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., reports a net profit of $4,347,902, or $4.57 per common share, for the twelve months ended June 30 of this year, as against a profit of $3,224,202, or $3.39 per share for the corresponding period of last year.

NAZARETH CEMENT CO., Nazareth, Penn., had a net profit of $430,952 or $2.40 per common share for the twelve months ended June 30, 1948, as compared with a profit of $236,146, or $1.15 per common share for the corresponding period in 1947.

CONSOLIDATED CEMENT CORP., Chicago, Ill., for the six months ended June 30, 1948, had a net profit of $177,300 and net sales of $1,859,200. This compares with a net profit of $32,600 and net sales of $1,235,200 for the like period of 1947.

GIANT PORTLAND CEMENT CO., Philadelphia, Penn., had a net income of $331,253 or $.39 per common share for the twelve months ended June 30, 1948, as against a net income of $208,116 or $.74 per common share in 1947. Net sales amounted to $2,797,309 this year, compared with $2,317,440 for the 1947 period.

PACIFIC COAST AGGREGATES, INC., San Francisco, Calif., reports a net profit of $205,943 for the three months ended June 30, 1948, and a net profit of $334,222 for the first six months of the year, with sales amounting to $3,200,826 in the second quarter and $6,037,290 in the half. This compares with 1947 profits of $88,947 in the second quarter and $196,436 in the first six months, with sales of $2,595,401 in the quarter and $4,927,082 in the half.

ALBERENE STONE CORP. OF VA., Schuyler, Va., had net sales of $125,300 and a net income of $11,948 for June 1948, as against sales of $94,052 and income of $3176 for June, 1947. The company has published the following account of income for the six months ended June 30:

	1948	1947
Net Sales	$662,245	$472,613
Cost of Sales	446,811	349,305
Admin., etc., exp.	115,255	93,175
Deprec. & deplet.	16,228	13,970
Taxes	6,000	4,560
Other deductions	1,521	959
Bad debt res.	607	423
Operating income	75,824	10,221
Other income, net	7,546	11,789
Total income	83,370	22,010
Federal taxes	33,348	8,804
Net income	50,022	13,206
Earned per share	$0.76	$0.20
Number of shares	65,745	65,745

KELLEY ISLAND LIME & TRANSPORTATION CO., Cleveland, Ohio, has published the below account of income for the six months to June 30:

	1948	1947
Net sales	$4,257,834	$2,973,271
Cost of sales	3,619,024	2,553,700
Selling, etc. expense	325,380	249,716
①Oper. profit	313,430	169,855
Other income	26,882	34,637
Total income	340,312	204,492
Other deductions	6,758	5,966
Fed. income tax	125,656	74,792
Net profit:		
3 mos. to 3-31	14,491	d 45,967
3 mos. to 6-30	193,406	169,701
6 months	$207,897	$123,734
Dividends	154,476	92,686
Surp. for period	53,421	31,048
Earn. surp., 1-1	698,515	393,822
Earn. surp., 6-30	751,936	424,871
Earned per share:		
Mar. quarter	$0.05	d $0.15
June quarter	0.62	0.55
6 months	$0.67	$0.40
No. of shares	308,952	308,952

①After depreciation, depletion and amortization: 1948, $329,063; 1947, $223,561.

Note: Net profit of subsidiaries not included above: 1948, $45,294 ($0.15 per sh.); 1947, $19,334 ($0.06 per sh.).

MATERIAL SERVICE CORP., Chicago, Ill., in its annual report, lists net income for 1947 at $2,112,496, or $27.59 a capital share, as compared with $1,093,994, or $14.29 per share in 1946. Net sales were $22,445,759 against $14,122,979 in 1946. A program of improvement and rehabilita-

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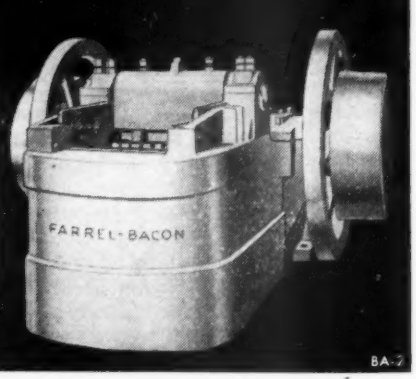

FARREL-BACON
ANSONIA, CONNECTICUT
BA-2

tion was started in 1946 which carried through into the current year, and the company spent $2,185,119, more than its total net income, on said expansion program in 1946, the report states.

GENERAL PORTLAND CEMENT CO., Chicago, Ill., reports the following earnings for the six month period ended June 30:

	1948	①1947
Net sales	$8,736,900	$6,447,500
Cost & expense	5,743,500	4,666,300
Operating profit	2,993,400	1,781,200
Other income	5,900	dr 63,700
Total income	2,999,300	1,717 500
Fed. income tax	1,140,000	659,000
Net profit	1,859,300	1,058,500
Earned per share	$1.85	$1.06
No. of shares	1,004,366	999,998

①Includes profits of predecessor companies from Jan. 1 to Feb. 19, 1947, prior to their consolidation into General Portland Cement Co.

PENNSYLVANIA-DIXIE CEMENT CORP., New York, N. Y., reports the following consolidated earnings for the three months to June 30:

	1948	1947
Net sales	$5,114,502	$3,676,552
Cost and expenses	3,861,914	3,105.444
Deprec. & deplet.	158,533	135,610
Operating profit	1,094,055	435,498
Other income, net	①154,288	48,377
Total income	1,248,343	483,875
Funded debt int.	22,882	26,653
Fed. income tax	454,200	148,300
Net profit	771,261	308.922
Earn., com. share	$1.46	$0.58
No. of com. shares	525,976	525,965

①Includes $114,126 interest on Federal tax refund.

DIAMOND ALKALI CO., Cleveland, Ohio, has completed negotiations for a $10,000,000 loan to round out a $30,000,000 program of plant expansion and product development, John A. Sargent, financial vice-president, announced.

PERMANENTE CEMENT CO., Oakland, Calif., reports earnings of $765,303 for the first quarter of its current fiscal year ended April 30, 1948, equal to $1.09 a share on 700,000 common shares outstanding. This is a 34.9 per cent increase over the corresponding period of the preceding year.

CALIFORNIA PORTLAND CEMENT CO., Los Angeles, Calif., has published the below account of income for years ended April 30:

	1948	1947
Operating profit	$4,892,041	$3,588,956
Depreciation and depletion	377,776	323,396
Fed. income tax	1,677,393	1,194,489
Net income	2,836,872	2,071,071
Dividends	1,550,000	1,500,000
Surplus for year	1,286,872	571,071
Prev. earn. surp.	4,642,868	4,206,417
Credit	17,193	15,381
Contingency res.		150,000
Earn. surp., 4-30	5,946,933	4,642,868
Earned per share	$56.74	$41.42
No. of shares	50,000	50,000

CALAVERAS CEMENT CO., San Francisco, Calif., reports that sales for the three months ending June 30, 1948, amounted to $1,182,268. This compares with a volume of $760,126 in the corresponding 1947 period. June quarterly results brought the company's sales for the first six months of this year to $2,064,443, compared with $1,400,997 for the like period a year ago.

WARNER CO., Philadelphia, Penn., had a net income of $772,614 or $1.62 per common share for the six months

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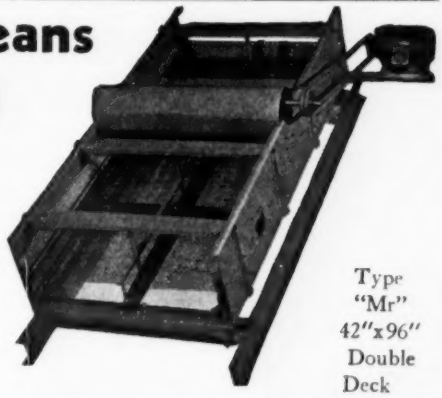

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AT HIGHEST EFFICIENCY . . . . with
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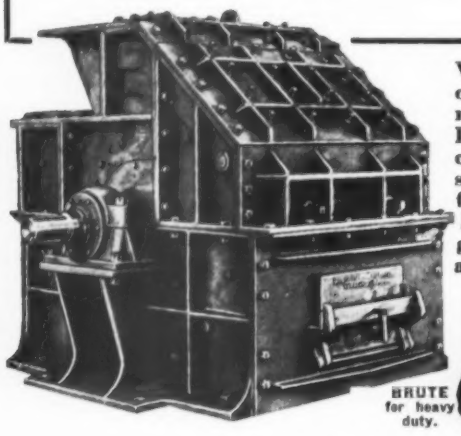

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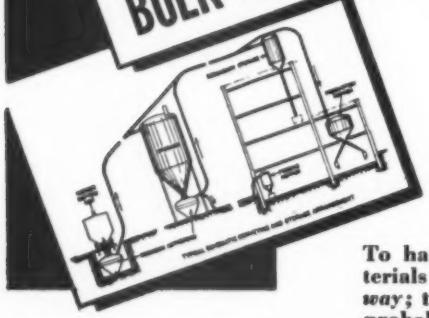
BULK Agricultural Limestone
BULK Fine Aggregate (dry)

ROBINSON *Air-Activated* CONVEYOR

From Crusher to Storage, from Storage to Car . . . it's here that the Robinson Air-Activated Conveyor will save you money in handling. Why?



- The Robinson System utilizes dry, low-volume air.
- It eliminates encrustation in conveyor lines which often happens in other pneumatic systems; moisture in low-volume air is readily controlled.
- There are no continuously moving parts, screw-feeds, bearings, or other parts which cause high maintenance or replacement costs.

Layout for conveying material from plant to car or truck would be similar.

To handle dry-pulverized or fine-granular materials in bulk pneumatically is *the economical way*; to handle them by the Robinson System is probably *the most economical way*. Our engineers will be glad to draw up Robinson plans and cost estimates for your requirements.

ROBINSON *Air-Activated* **CONVEYOR SYSTEMS**

Division of MORSE BOULGER DESTRUCTOR CO.

Representatives in Principal Cities

211-H EAST 42nd STREET • NEW YORK 17, N. Y.

Represented in England by Blaw-Knox, Ltd., London

Represented in the French Union and Benelux by Cie Francaise Blaw-Knox, Paris

ended June 30, 1948, as compared with income of $654,513 or $1.72 per common share for the corresponding period of last year. Contracts on hand for the company's principal product, Central-Mix concrete, are over double the amount at any previous midyear, and much new business is in active prospect for public works, utilities and many types of private work, the company reports.

ALPHA PORTLAND CEMENT CO., Easton, Penn., for the twelve months to June 30, gives the following account of earnings:

	1948	1947
Net sales	$17,092,411	$13,592,766
Oper. expenses	13,119,391	10,390,061
Depreciation and depletion	614,227	579,254
Operating profit	3,358,792	2,623,451
Other income	163,040	118,098
Total income	3,521,832	2,741,549
Income charges	139,963	64,087
Fed. income tax	1,331,223	1,045,936
Net profit	2,050,646	1,631,527
Common divs.	1,178,712	1,034,323
Surplus for year	871,934	597,204
Prev. surplus	3,736,157	3,138,953
Surplus, June 30	4,608,091	3,736,157

NORTH AMERICAN CEMENT CORP., New York, N. Y., reports a net profit of $470,818 for the twelve months ended June 30, 1948, as against a profit of $293,114 for the same period of last year.

NATIONAL GYPSUM CO., Buffalo, N. Y., has published the below account of income for the first six months and the second quarter of 1947, and 1948:

3 mos. to June 30:	1948	1947
Net Sales	$16,508,292	$12,378,574
Cost of sales	12,179,117	9,234,441
Selling, etc., exp.	1,358,014	1,183,850
*Operating profit	2,971,161	1,960,283
†Other income	112,084	165,213
Total income	3,083,245	2,125,496
Interest	100,490	68,562
Doubtful accts.	45,111	33,597
Other deductions	23,040	51,008
Income taxes	1,099,000	755,500
Net profit	1,815,604	1,216,829
Earn., pfd. share	$20.43	$14.79
6 mos. to June 30:		
Net sales	$31,896,306	$23,998,469
Cost of sales	23,686,657	17,699,535
Selling, etc., exp.	2,664,821	2,283,271
*Oper. profit	5,544,828	4,015,663
†Other income	157,830	359,820
Total income	5,702,658	4,375,483
Interest	203,051	138,108
Doubt. accts.	86,857	65,127
Other deductions	45,213	77,802
Income taxes	2,030,000	1,563,000
Net profit	3,337,537	2,531,446
Earn., pfd. share	$37.56	$30.78
No. of pfd. shares	88,850	82,250

*Includes marine operations: 3 mos., 1948, $73,336; 1947, $131,774; 6 mos., 1948, $89,536; 1947, $285,596.

†After depreciation, depletion and amortization: 3 mos., 1948, $525,695; 1947, $347,152; 6 mos., 1948, $998,827; 1947, $667,599.

The company also reports that of 422,467 additional common shares offered recently, 325,972 shares were subscribed for by company stockholders and 80,830 were purchased by persons who didn't own any National Gypsum stock at the time the new issue was offered but acquired rights to buy the new shares. Only 15,655 shares remain to be taken by the underwriters. Proceeds totaling $5,428,700 will be added to working capital.

AMICO SAND & GRAVEL CO., Morrisville, Penn., has issued 10,000 shares of 8 per cent non-voting cumulative preferred stock, series A (par $10) for expansion of business.

Manufacturers' News

Hewitt-Robins, Inc., New York, N. Y., has appointed J. J. Murray to the newly created position of export manager. Mr. Murray is now in Europe studying private and government needs for material handling equipment and mechanical rubber goods. Later he will go to the Middle East. Upon his return from Europe, Mr. Murray will make his headquarters at the New York City executive offices.

American Hard Wall Plaster Co., Utica, N. Y., has announced the election of Philip J. Frenz as vice-president in charge of sales and purchases.

St. Regis Sales Corp., subsidiary of St. Regis Paper Co., New York, N. Y., has announced the appointment of Norton B. Jackson as advertising manager of the company. Mr. Jackson was formerly advertising manager of American Can Co., and previous to that had been advertising manager of the Thatcher Glass Manufacturing Co., Inc., Elmira, N. Y. Mr. Jackson is a member of the Job Finding Committee of the Advertising Club of New York and of the Public Relations Committee of the Boy Scouts of America.

Norton B. Jackson

Koehring Co., Milwaukee, Wis., announces that John S. Conway, formerly export sales manager, has been appointed general sales manager, succeeding J. F. Robbins who will become president and general manager of the Capitol Equipment Co., a Koehring distributor in Harrisburg, Penn. John E. Chadwick has been named assistant sales manager, and R. E. Stewart, export sales manager.

Gordon Lubrication Co., McKees Rocks, Penn., authorized distributors of RPM products for the California Oil Co., a subsidiary of the Standard Oil Co. of California, has completed its new river Terminal. An inspection tour and open house was held on September 23 for distributors of the company and guests.

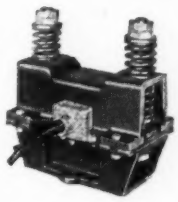
The Euclid Road Machinery Co., Cleveland, Ohio, has released a new full 16-mm. sound film entitled "Euclids Move the Earth," which is a pictorial, on-the-job movie of the various applications of earth moving equipment in metallic and non-metallic strip mines, airports, dams, levees, etc. This 30-minute presentation, which was previewed at the recent A.R.B.A. Road Show in Chicago, may be obtained through Euclid representatives or distributors or the sales development department in Cleveland, Ohio.

General Electric Co., Schenectady, N. Y., has appointed A. H. Graham

BETTER CONCRETE PRODUCTS WITH SYNTRON

"Pulsating Magnet"

ELECTRIC VIBRATORS



Powerful, pulsating electro-magnets — that vibrate 3600 times per minute from 110 or 220 or 440 volt, 60 cycle A.C.

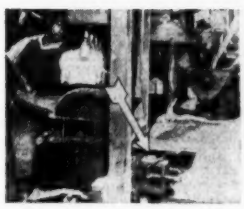
No cams, gears, eccentrics, motors, etc.

ON BLOCK MACHINES

Their powerful vibrations will produce a denser, stronger block, and improve its appearance.

Applied to either the mold box or the pallet, depending upon the design of the machine.

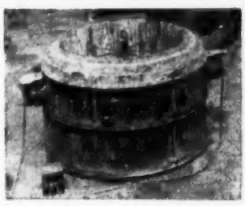
For hand or power machines.



ON PRECAST FORMS

Improve the quality and appearance of all types of pre-cast concrete products — sewer pipe, lintels, joists, standards, burial vaults, etc.

Speed up placing and setting and eliminate hand rodding and pounding.



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SYNTRON CO. 450 Lexington, Homer City, Pa.

MANGANESE STEEL CASTINGS

for
PULVERIZERS
CRUSHERS
ROLLS
SCREENS

for
SHOVELS
DREDGES
CRANES
CONVEYORS

The Frog, Switch & Mfg. Co.

Established 1881 CARLISLE, PA.

FOR ALL DIG-AND-HAUL WORK!

Sauerman Power Scraper working with portable screening plant

Sauerman Slackline Cableway lifting gravel from 100 ft. under water

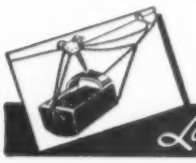
Sauerman Machines Cut Costs

Under one man control, a Sauerman Scraper or Slackline Cableway can reach out 1,000 ft. or more and dig, haul and dump gravel, clay, or any bulk material. Simple operation! Economical use of power!

A Sauerman machine can be installed to reach across a pit, pond, river or stockpile, or up to the top of a hill. It moves material rapidly anywhere within its wide radius. Flexible for any ground conditions. Costs only a few cents per cubic yard handled. Gas, electric or diesel.

Illustrated catalog mailed on request.

SAUERMAN BROS., INC.
530 S. Clinton St., Chicago 7



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NO SAG NO PULL OUT

With Cleveland Wire Screen Section Assemblies

• Increase your profits and stop tonnage losses with the specially prepared, reinforced screen sections for vibrators. This standard type of edge is available in five different styles for electrical and mechanical vibrating machines.

Let our wire screen specialist show you how you can adapt these screen section assemblies to increase your profits.

There is a CLEVELAND Wire Screen for every purpose.

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- LONGER SCREEN LIFE
- EXTRA STRENGTH
- EASY TO CHANGE
- DRUM-TIGHT TENSION

For detailed information on Cleveland Screen Section Assemblies write today for BULLETIN No. 6.

THE CLEVELAND WIRE CLOTH & MFG. CO.
3574 E. 78 STREET CLEVELAND 5, OHIO

as manager of the d-c armored motor engineering division, small and medium motor divisions, Erie Works.

Atlas Powder Co., Wilmington, Del., announces the appointment of R. K. Gottshall as assistant general manager. He was formerly director of sales of the explosives department. W. E. Collins, Jr., former manager of the Seattle, Wash., sales district, succeeds Mr. Gottshall as director of sales, and George W. Thompson, special representative, New York sales district, has been transferred to Seattle as manager of the district sales office.

Lima Shovel and Crane Division, Lima Hamilton Corp., Ohio, announces the appointment of Eastcoast Equipment Co., Inc., Garwood, N. J., as sales agent in northern New Jersey.

Blaw-Knox Division, Blaw-Knox Co., Pittsburgh, Penn., announces that Arthur A. Levison, vice-president in charge of the construction equipment, has been elected a director of the Construction Industries Association, Inc., for a three year term. This association is affiliated with the American Road Builders' Association and constitutes the Manufacturers' Division of A.R.B.A.

Hyster Co., Portland, Ore., has appointed Shipping Utilities, St. Louis, Mo., to replace Wharton L. Peters, Inc., as truck distributor to handle sales, parts and service in 36 counties of Missouri and 50 counties of Illinois.

The Wheelco Instrument Co., Chicago, Ill., has opened a new sales office in Milwaukee, Wis. M. A. Embertson, formerly sales engineer at Chicago, will be in charge of the new office.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has appointed W. L. Manly as manager of dealer sales, succeeding W. A. Meyer, who has been named assistant manager of the Texrope drive department. John Druml and Samuel W. Ouweneel have been appointed chief inspectors of the general machinery and tractor divisions, respectively. They succeed G. William Warner, who has retired.

Marion Power Shovel Co., Marion, Ohio, has promoted David E. Rizor to the position of assistant to John P. Courtright, vice-president in charge of sales, with headquarters at Marion, Ohio. C. M. Gegenheimer has been named to succeed Mr. Rizor as district manager at Chicago, and A. W. McGraw will succeed Mr. Gegenheimer as district manager at St. Louis, Mo.

Bemis Bro. Bag Co., St. Louis, Mo., has announced the appointment of Erik A. Johnson as general traffic manager, succeeding W. R. Huey who died August 22.

Pettibone Mulliken Corp., Chicago, Ill., has announced the purchase of the assets and business of Universal Engineering Corp., Cedar Rapids, Iowa, manufacturers of crushing machinery and allied equipment for rock and gravel plants.

The Wellman Engineering Co., Cleveland, Ohio, announces the ap-

pointment of Jack R. Gregson as Eastern district sales manager of the bucket department, with headquarters in New York, N. Y.

Geo. P. Reintjes Co., Kansas City, Mo., announces the appointment of C. R. Fischer, Philadelphia, Penn., as sales representative for the eastern half of Pennsylvania and New Jersey.

Thermoid Co., Trenton, N. J., announces that its new plant at Nephi, Utah, is now approaching 75 percent operation in manufacturing industrial belts (conveyor, transmission and V), hose of all kinds, including rotary and wire braid hydraulic, molded products for oil fields, and fan belts and radiator hose for the automotive trade.

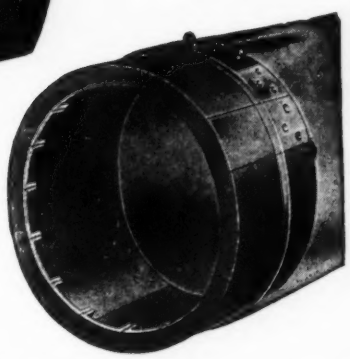
Sintering Machinery Corp., Netcong, N. J., announces that Reed W. Hyde has joined the corporation as president. After graduating from the School of Mines of Columbia University, Mr. Hyde spent several years with the American Smelting and Refining Co., joining the Dwight & Lloyd Sintering Co. in 1917 as engineer. He subsequently became head of the research and development department and then assistant to the presidents of Dwight & Lloyd Metallurgical Co. and Dwight & Lloyd Sintering Co. In 1942 he became associated with the Irvinton Smelting and Refining Works.

Bemis Bros. Bag Co., St. Louis, Mo., announces that the recently completed plant of the Bemis Paper Bag Co. at Vancouver, Washington, has reached

PYRASTEEL

S-E-G-M-E-N-T-A-L KILN ENDS

Easier to Install . . . Longer Service Life !



About 165 million barrels of cement—over 76% of the annual output—is produced in plants using either or both of our alloys, PYRASTEEL and EVANSTEEL.

PYRASTEEL is equally effective and economical in other high-heat applications, such as conveyor screws, feed pipes, clinker coolers, drag chains, and cement cooling equipment.

You can't beat this performance of PYRASTEEL Kiln Ends for avoiding burnouts and shutdowns, and insuring continuous production with low cost maintenance.

In the past 20 years over 1000 PYRASTEEL Kiln Ends have been installed. Some have lasted for 14 years without a failure—6 to 8 years' service is quite common.

Unit Segments are easy to install or replace.

Write for PYRASTEEL Bulletin

CHICAGO STEEL FOUNDRY COMPANY

PYRASTEEL for high temperatures

KEDZIE AVE & 37TH ST. CHICAGO 32, ILL. Makers of Alloy Steel for 35 Years

EVANSTEEL for strength

WEATHER-PROOF

HAMMOND MULTI-WALL BAGS

. . . moisture-proof plies give EXTRA PROTECTION

Maximum protection against rain, snow, sleet or leaky cars is assured when you use Hammond Multi-Wall Bags. Special moisture-proof plies safeguard your products requiring extra protection, and minimize your shipping problems.

SEWN · PASTED · OPEN MOUTH OR VALVE STYLE

HAMMOND BAG & PAPER CO.

PAPER MILL AND BAG FACTORY · WELLSBURG, W. VA.

Plants handling Cement, Lime, Gypsum, Sand, Gravel, Crushed Stone etc. use the WEIGHTOMETER for fast accurate production.

WEIGHTOMETER gives a continuous, automatic, and accurate weight record of materials in transit at an extremely low operating cost. All producers of bulk materials handled by belt conveyors need this dependable check on production figures supplied by MERRICK WEIGHTOMETER.

Merrick Scale Mfg. Co.
Passaic, New Jersey

full production and is now completely serving the territory previously served by the Bemis plant at St. Helens, Oregon.

The Four Wheel Drive Auto Co., Clintonville, Wis., announces that Donald B. Olen, formerly chairman of the manufacturing committee, has been named director of the engineering division, and H. B. Dodge, former director, has been promoted to technical advisor to the management of the company. G. D. Simonds, formerly manager of design engineering, has been named chief engineer in charge of design of standard FWD models. B. G. Donley has been made manager of development engineering, and James A. Sorenson, metallurgist for the company for more than 30 years, now has the additional duties of research engineer.

DeLaval Steam Turbine Co., Trenton, N. J., has appointed J. A. Greenland as district manager of the Seattle office. He has been with the company since 1938.

Committee for Economic Development, New York, N. Y., announces that Philip D. Reed, chairman of the board of the General Electric Co., has been elected chairman of the research and policy committee of the C.E.D., succeeding Raymond Rubicam whose term has expired.

The Dow Chemical Co., Midland, Mich., announces that John F. White has been transferred from the New York office to the Boston office, where he will sell general magnesium products throughout Massachusetts, Vermont, New Hampshire, Maine and a part of Connecticut.

The Osgood Co., Marion, Ohio, announces that Fred L. White, former chief engineer, has been appointed development and consulting engineer, and that John E. Callouette has been named to succeed Mr. White as chief engineer. Mr. White joined the company in 1917 as engineer and draftsman and was appointed chief engineer in 1937. During that time, he has secured many patents for developments of Osgood machinery. Mr. Callouette

Fred L. White

John E. Callouette

graduated from the University of Michigan in 1940 as a mechanical engineer, and has served as design engineer of Clark Brothers Corp. and as chief power engineer for the Industrial Rayon Corp. During the war, he held the rank of Lt. Senior Grade in the U. S. Navy, serving in the design section of the Bureau of Ships.

Chain Belt Co., Milwaukee, Wis. has opened a new district sales office at 2900 West Clay St., Richmond, Va., with Fred W. Taylor as district manager.

Griffin & Co., Inc., Louisville, Ky., has been licensed to build and market the self-cleaning filtering dust collector and improvements thereon as developed by H. J. Hersey, Jr., of New York. Other licensees of the Hersey filter are Pulverizing Machinery Co., Summit, N. J.; Shaer & Turner Engineering Co., West Roxbury, Mass.; Sprake & Co., San Francisco; New Jersey Zinc Co.; The Flintkote Co., and Russell-Miller Milling Co.

Robins Conveyors, division of Hewitt-Robins, Inc., Passaic, N. J., has moved its Detroit office to 2617 W. Grand Blvd.

Taylor Forge & Pipe Works, Chicago, Ill., announce that Robert M. (Bob) Vilsack has joined the sales department, reporting to the main plant at Chicago, Ill. Mr. Vilsack was recently associated with the M. W. Kellogg Co., New York, in engineering and sales work.

Bailey Meter Co., Cleveland, Ohio, has announced that G. L. Harman, Jr., has been appointed manager of the Milwaukee branch office, succeeding R. V. Knapp, who has resigned to accept a position with the Mosinee Paper Mills Co., Inc. Mr. Herman will be

30 SECONDS... and another load of rock is on its way with the DEMPSTER DUMPSTER SYSTEM

Attach two chains to the loaded container . . . pull a lever in the truck cab . . . the load is hydraulically lifted into carrying position and you're on your way to the crusher in less than 30 seconds. That quick pick-up is important, but just as important is the fact that your loading crew is continuously loading containers. Trucks don't stand idle waiting to be loaded . . . there's no waiting by loading crews between truck trips. This cycle of continuous loading, continuous hauling is the secret behind the low cost Dempster-Dumpster System. One truck hoisting unit handles any number of containers spotted through your quarry . . . does the work of 4 or 5 conventional trucks. Cost of installing is remarkably low, write for catalog 247 today. Photo at right shows automatic dumping operation at crusher.

DEMPSTER BROS., inc., 3108 N. Knox, Knoxville 17, Tenn.

assisted by J. L. Andrews, mechanical engineer, and L. C. Smith, service engineer.

Mack Trucks, Inc., New York, N. Y., has appointed W. M. Watkins as district manager of the Indianapolis branch. He was formerly wholesale manager for the Dallas branch.

Westinghouse Electric Corp., Pittsburgh, Penn., announces that A. C. Monteith has been elected vice-president in charge of engineering and research. He succeeds Marvin W. Smith who has been named executive vice-president of Baldwin Locomotive Works.

The B. F. Goodrich Co., Akron, Ohio, announces that a multi-million dollar plant for the manufacture of industrial rubber belting is being erected near the site of the original plant built by Dr. B. F. Goodrich in 1870. The new plant will contain 150,000 square feet of floor space.

Thermoid Co., Trenton, N. J., has elected Lloyd R. Leaver as vice-president in charge of the industrial rubber products division. Mr. Leaver, who is president of Joseph Stokes Co., Ltd., Welland, Ont., Canada, will continue to direct the policies of this subsidiary from Trenton, N. J.

George Haiss Mfg. Co., Inc., division of Pettibone Mulliken Corp., New York, N. Y. and Chicago, Ill., announces the appointment of H. D. Williams as sales and service representative in eastern Pennsylvania and southern New Jersey. J. Banatar of Brooklyn, N. Y., will be sales representative in the five boroughs of New York City, and John F. Day, Buffalo, N. Y., has been named sales representative for the northwestern sections of New York and Pennsylvania.

Timken Roller Bearing Co., Canton, Ohio, has elected Whitley B. Moore as vice-president in charge of sales to succeed L. M. Klinedinst, who has retired after 43 years of service with the company, but will remain as a director and serve as sales consultant. Mr. Moore was formerly director of sales.

Clipper Mfg. Co., Kansas City, Mo., manufacturers of masonry saws for cutting brick, tile, concrete, glass and marble or any masonry material, has opened a new factory warehouse and office at 422 Market St., San Francisco, Calif.

Noble Co., Oakland, Calif., manufacturer of cement and aggregate batching plants, announces that Roger Blaney has been appointed sales engineer to cover the Sacramento and San Joaquin Valley.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has announced that G. William Warner, chief inspector for the last 32 years, has retired after 50 years of service. A native of London, England, Mr. Warner was first employed as a machinist. In 1901 he was named chief inspector of the Scranton, Penn., plant. He was made hydraulic inspector at the main works in Milwaukee in 1912 and four years later was named chief inspector.

a thousand and one
job-proved wire ropes

There's a *Macwhyte* rope that's the *right* rope for your equipment

Macwhyte Wire Rope

Use PREformed Whyte Strand for easy handling and longer service

Macwhyte Distributors and Mill Depots — carry stocks for immediate delivery. Macwhyte representatives will recommend the correct rope for your equipment. Catalog on request.

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2949 Fourteenth Avenue, Kenosha, Wisconsin
Manufacturers of Internally Lubricated Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies.

Mill Depots:
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Distributors throughout U. S. A. and other countries.

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AN EAGLE LOADER
SOON PAYS FOR ITSELF

FROM JOB TO JOB AT TRUCK SPEED
•
ONE MAN OPERATION
•
HYDRAULIC CONTROLS

Loads any loose material quickly and economically

WRITE FOR DETAILED SPECIFICATIONS
Dept. R-108

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PULVERIZERS • CONVEYORS • LOADERS
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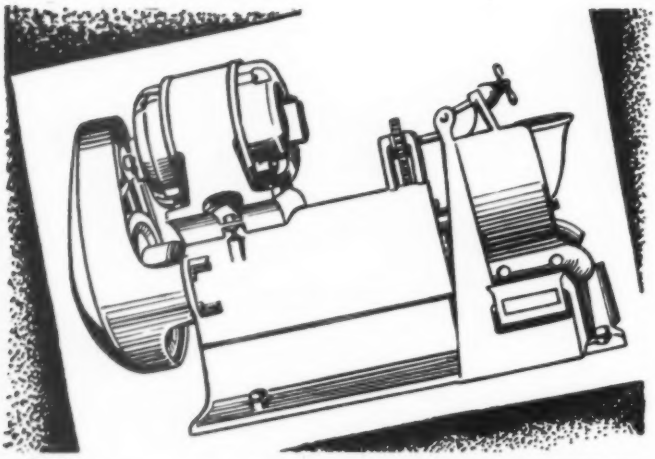

Massco-McCool PULVERIZER

Grinds any laboratory sample to 150 mesh in one pass. Gyratory motion insures long disc life. Construction prevents grease contamination of samples. Easy, positive self-locking adjustment. Anti-friction bearings. Chamber housing, rotating and fixed discs always aligned. No gears—quieter and without vibration. Easily cleaned. Only two H.P. motor required.

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The Mine & Smelter Supply Co.

CANADIAN VICKERS, LTD. *Montreal*
W. R. JUDSON *Santiago, Chile*

FB CRUSHERS

FOR SALE

USED PRIMARY

FARREL-BACON

JAW CRUSHERS

IN EXCELLENT CONDITION

Size	Location	Availability
60 x 42 (39B)	Mass.	Jan. 1, 1949
42 x 40 (30E)	N. J.	Dec. 15, 1948
36 x 24 (15B)	Conn.	Dec. 1, 1948
36 x 18 (12B)	Mass.	Immediate

The above machines (except 12B) are being replaced with larger primary crushers. Each crusher may be inspected on location in operating plants. All are subject to prior sale.

Call or write

BACON-GREENE & MILROY
205 Church St. New Haven, Conn.
Tel. 7-1966

New Leader *Super Deluxe*

LIME AND ROCK SPREADER

The most advanced spreader on the market. Spreads lime, sand, chips, gravel . . . hauls and self-unloads all types of construction materials including crushed rock. Reinforced welded steel frame, wooden hopper, new simplified worm gear drive direct from truck power take-off. Mounts on any standard truck chassis.

Write for illustrated literature.

New swinging endgate. Distributor discs easily and quickly removed.

HIGHWAY EQUIPMENT COMPANY, INC.
604 D. Avenue N.W. Cedar Rapids, Iowa
Manufacturers of the World's Most Complete Line of Spreaders

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custom-made

Multi-wall Shipping Sacks

(valve and open-mouth types)

We make them, complete from tree to finished paper bag

Kraft Bag Corporation

630 Fifth Avenue, New York 20, N.Y.

Mills at GILMAN, VT.

INDUSTRY NEWS

Concrete Joist and Filler Block Floors

A BOOKLET containing technical information on types and designs of concrete joist and concrete filler block floors has just been released by the National Concrete Masonry Association. Foreword of the publication states: "The design tables and complementary data presented in this booklet and its supplements have been prepared to assist the architect and structural engineer in the design of concrete joist-concrete filler block floors."

This 19-page booklet contains charts of weights, dimensions, load limits, construction diagrams and job photographs of different types of floor. Also included is a page of suggested specifications for concrete floor filler units. Supplements I, II and III carry data on floors constructed with special sizes of block; i.e., 21-, 24- and 30-in. units. The separate supplements are provided so that any particular producer may distribute data sheets relative to the size units he produces, without creating a demand in the area he serves for special sizes. Space is provided on covers of the booklet and supplements for company name imprinting.

Southern California Block

CONCRETE MASONRY MANUFACTURERS ASSOCIATION of Southern California has reported that sale and manufacture of concrete block have more than doubled since the first of the year. And yet the majority of plants are making very little if any sales effort. Demand is greater than production, and is greater than anticipated production that will increase with addition of machines now on order in member plants.

Sign With Union

FOUR SPRINGFIELD, ILL., concrete block plants signed a contract with the Hod Carriers and Common Laborers Union for a ten-cent hourly wage increase. About 85 employees were involved. Under the new contract, employees who have been with a company for five years will receive two weeks vacation each year, and those with seniority of between one and five years will receive one week vacations.

Concrete Log-Like Walls

CONCRETE is now being used to achieve a realistic log-like exterior for cabins, homes, lodges and other rustic buildings. The primitive effect is being obtained by using the concrete with fire-resistant metal lathing. The finish is self-insulated through channels in the pre-formed metal lath under the cement base-coat, and the colored cement grout, textured final coating. Authentic replicas of bark colors representing birch, pine, oak or walnut are available. The finish can be applied to old or new buildings.

Concrete Towers for Power Line

ELECTRICITY SUPPLY COMMISSION, Johannesburg, Transvaal, South Africa, is employing reinforced concrete angle and strain towers for an 88 kv. power line in the vicinity, Dr. S. Macerata, American Concrete Institute, reports. The power line is approximately 60 miles long, and has been erected entirely on the reinforced concrete supports.

Start Ready-Mix Operation

ALLIED ENGINEERING CO., Atlantic Iowa, has recently placed a new ready mixed concrete plant in operation. It is expected that customers in a 25-mile radius will be served by the company's transit mixer trucks. Officers of the company are: C. L. Starr, president; Don C. Hartkopf, vice-president and production manager; and D. R. Peasley, secretary.

Demonstrates Celocrete Units

WORRALL BROTHERS, Louisville, Ky., recently demonstrated the structural uses of Celocrete units in an exhibit at the recent home show sponsored by the Louisville Association of Home Builders. Model homes were set up by the company with lintels and joists of precast Celocrete, and walls of 8-x 16-in. Celocrete block, painted on the outside with waterproof cement paint and left exposed inside. Worrall Brothers also supplied Celocrete units for a $30,000 home given away at the show. John C. Long is president of the firm.

Starts Manufacture of Concrete Burial Vaults

PHILLIP H. OGDEN, East St. Louis, Ill., recently opened a plant for the manufacture of concrete burial vaults. Mr. Ogden is an embalmer. The plant contains modern machinery, including a truck for private delivery.

Concrete Company Merger

CONCRETE, INC., St. Louis, Mo., recently held a special meeting of shareholders to vote on a plan to merge General Material Co. with Concrete, Inc., the latter firm to be the surviving corporation.

HOMER READY-MIX CONCRETE PLANT has been opened at Junction City, Kan., by W. O. Homer. Equipment includes three transit mix trucks, power shovel and hopper. Both plant and equipment represent an investment of $45,000.

MERLE HAY CONCRETE PRODUCTS CO. has started production of concrete drain tile, ranging up to 12-in. in diameter, at its new plant in Des Moines, Iowa. Building and equipment represent an investment of $50,000, Robert M. Astley, owner, said. Capacity is 3500 tile per day. Production of concrete block also is planned.

JAMES O'DRISCOLL has opened a concrete block plant at Gibson, Ariz.

JAMES C. HAMMEL AND GEORGE W. FULLINGTON have purchased the Vibrated Concrete and Sand business of D. L. Wheelock at Clay Center, Kan. The new owners' plan to operate the business as before making 4-, 8-, and 12-in. block, copings, lintels, pipe, etc., but will use the name, Clay Center Concrete and Sand Company.

C. J. MORRITZ has opened a ready mixed concrete plant at Effingham, Ill.

WILLIAM DOWNING BLOCK PLANT, formerly located at Russellville, Ohio, has been purchased by Peebles Cement Products and is now in operation at Peebles, Ohio. Plant capacity is 1000 block per day.

BROWN, BARNES AND JONES READY-MIX CONCRETE CO. is engaged in the production of concrete products, sand, gravel and cement at Alexander City, Ala. The main product is transit-mixed concrete using two Dodge mixer trucks which have a capacity of 2-cu. yds. each and can deliver 50 yds. of concrete per 10-hr. working day. Steel-reinforced fence posts, land and highway markers, flagstones of various shapes and sizes, and benches also are manufactured.

ASSINK BROS. SAND AND GRAVEL CO., Cedar Falls, Iowa, is constructing a ready mixed concrete plant to be housed in a 28- x 80-ft. concrete block building, James Assink has announced.

PLEASANTON CONCRETE PRODUCTS CO., Pleasanton, Kan., has been established by Ed Jirik and J. T. Jones.

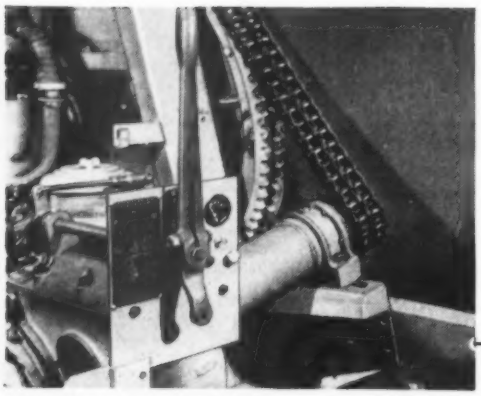
JOHN AND HAROLD MILLER have started production of concrete block at Broadus, Mont. Capacity is 700 standard size block per day.

SHERIDAN CONCRETE AND POTTERY WORKS, Sheridan, Wyo., has expanded operations to produce some 2000 block per day as against a capacity of 750 block per day last year, Pete Tissino, manager and owner, has announced. The company also manufactures fountains, bird baths, pottery, jars, vases and ornaments.

SOUTH DIXIE SUPPLY CO. is in the production of concrete block at Bowling Green, Ohio.

WAMIX, INC., producer and distributor of air-entrained cement, has been opened at Dallas, Tex. Tom L. Amis and O. B. English, principal stockholders, said the firm is capable of producing 250 yds. of concrete per day. The Wamix plant and equipment is valued at $55,000.

MERIT CONCRETE CO. of Missouri has been incorporated at Kansas City by John H. Demaree, Malcolm A. Boyer and James A. Bray.



THE CHAIN TAKES THE STRAIN

The exclusive Rex chain drum drive eliminates stresses and strains. The chain protects transmission . . . gears . . . shafting . . . power plant. It eliminates binding between drum and transmission as the truck chassis weaves over uneven ground. The chain effectively dampens vibration, assuring far less driver fatigue.

Life-Saver
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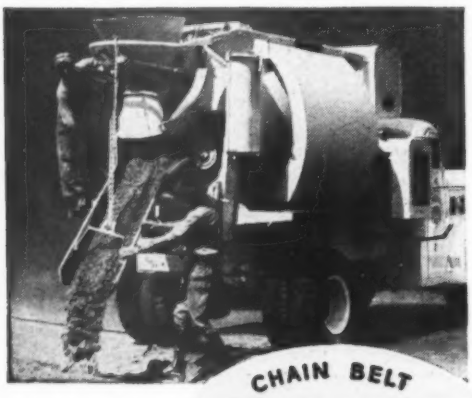

Lower Maintenance and Operating Cost

The Rex drum drive is a weight-saver. It eliminates the need of bulky, excessively heavy transmission cases, shafting, bearings, etc. This saving in weight here permits Rex to build added strength into parts where it is really needed . . . blades, drum rollers, drum shell and drum support. Here's why Rex gives you lower maintenance costs and assures less lost operating time.

Time-Saving, Fast Discharge

You'll save minutes every batch with Rex Moto-Mixers. Since Rex mixes in the discharge direction, the batch is always right up at the opening . . . ready to come out in a hurry. Deep spiral scoops speed the batch out *fast!* Remember, it's at the job site where speed is important to avoid holding up your customer's schedules.

For all facts, see your Rex Distributor or write for Bulletin No. 468, Chain Belt Co. of Milwaukee, 1649 W. Bruce St., Milwaukee 4, Wis.

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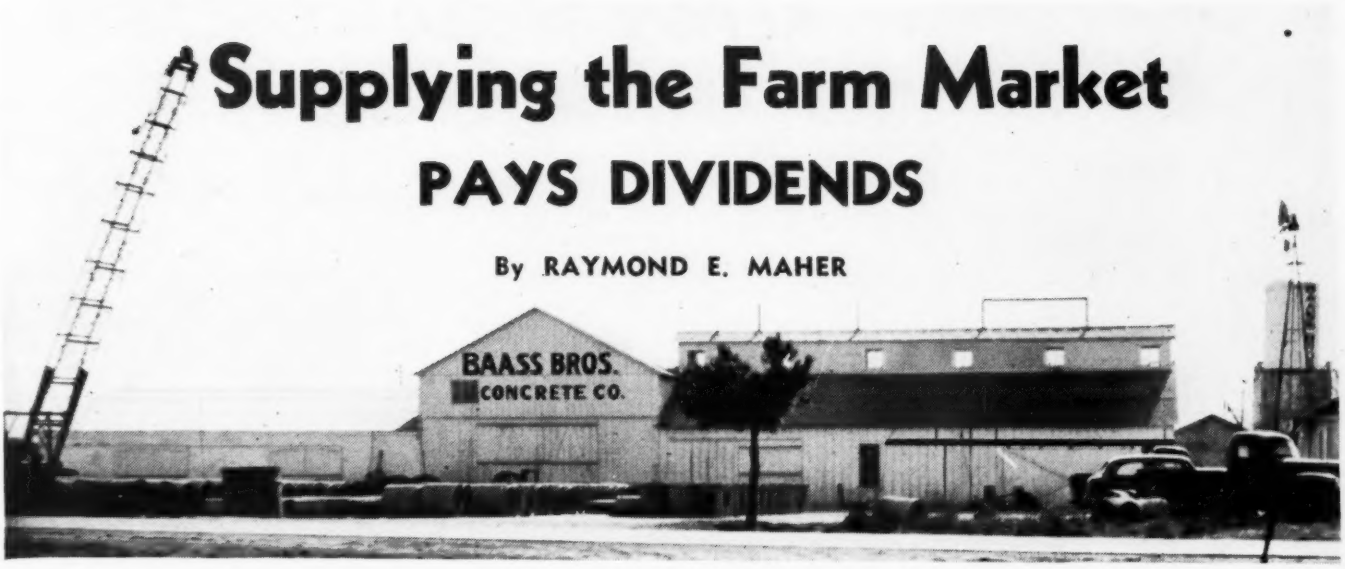
CONSTRUCTION MACHINERY

Moto-Mixers • Moto-Agitators

Supplying the Farm Market PAYS DIVIDENDS

By RAYMOND E. MAHER



General view of plant with crane for handling large pipe and forms in foreground

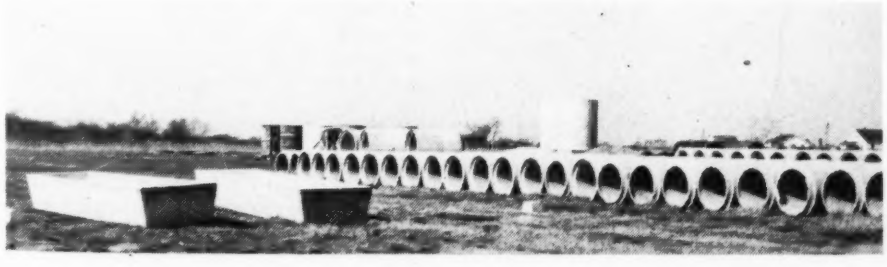
SERVING South Texas farmers and ranchers for 20 years, the Baass Brothers Concrete Co., Victoria, Texas has played no small part in the agricultural and livestock developments in this area. Products of this enterprising concern include; drainage tiling in the lowlands, stock water tanks for the uplands, and water gates in the coastal rice-lands over a radius of 100 miles from the plant. E. J. Baass, one of the owners, estimates that concrete tiles supplied by his company had reclaimed 100,000 acres for farming.

There has been a particularly heavy demand from ranchers for concrete cisterns and water tanks. Ranchers are depending less and less on stream water which often is contaminated. In one case 1500 head of livestock were killed by drinking arsenic-contaminated water in Little Linville Creek in Brazoria County, Texas. Another factor favoring concrete water tanks is that cattle do not have to travel very far for water and therefore keep and put on weight more rapidly. H. R. Baass supervises field operations and sales of concrete products among farmers and ranchers.

Cisterns are generally much larger than the tanks, holding upwards of 4000 gal. Cisterns are preferred by many cattlemen as they hold more water and keep it cooler. Tanks are selected by others as they scatter the herds better.

A mix of gravel, sand, and cement in the proportions of 2-2-1 has been found to give a durable concrete when the proper amount of water is added. Finished tanks are delivered to the site of installation by the company's trucks, four of which are kept busy. A completely equipped garage is available for truck maintenance. Twenty years ago when the company started, two helpers were employed. Today the company has 80 employes.

Modern garage completely equipped for maintenance of trucks and machinery



Some of the water tanks, cistern, and concrete pipe products made by this company

Sand-Cement Coating for Masonry

A NEW METHOD of applying fresh cement mortar to masonry, to be known as the Bondact Process, has been announced by The Consolidated Sales Co., Detroit, Mich. The method is said to do away with spikes, rods, and similar devices which often are necessary to anchor the freshly applied mortar to the old surface.

By the Bondact process, a mixture of dry sand and cement is put in a hopper connected by a flexible hose to a hand-held spray gun. Compressed air entering the gun from a side port creates a vacuum that siphons the mix from the hopper and, in combination with a jet of water admitted through another port, forcibly ejects the mortar from the nozzle. The water is atomized by the air and hydrates the cement before application of the mix.

At the beginning of the operations the equipment virtually sandblasts the surface to be covered because the mortar strikes with such an impact most of the grains of sand rebound, leaving behind their cement coating which penetrates cracks and pores. When a film of neat cement approximately 1/64-in. thick has been deposited, the sand becomes embedded and only about 25 per cent continues to rebound. This layer serves as a bond between the old and the new materials, which may be built up to any desired thickness. The mix is composed of one bag of cement and 4-cu. ft. of sand.

READY MIXED CONCRETE
Invades Chicago Area

By DAVID MOCINE

Crane lifting porch slabs to trailer for haul to construction site, Corbetta Construction Co. Vacuum Concrete, Inc., lifting device attachment for handling precast section

TO THOSE who have followed trends of concrete placing in Chicago and vicinity, the accompanying reports of three ready mixed concrete operations now being carried on for the first time in this area should be of interest. One is serving a huge housing project that requires poured-in-place and pre-cast concrete, delivered in non-agitating and agitating type equipment, respectively. The second is a commercial plant using 3- and 6-cu. yd. non-agitating type delivery equipment; and the third is a contractor who is using drum-type agitating equipment on a large powerhouse concrete pour that will take three years for completion.

Allied Concrete Supply Co., located in Chicago and using non-agitating type equipment for ready mixed concrete delivery, is in the process of erecting overhead bins, weigh-batchers and a tilting mixer. While the new plant is being erected, this operator is using two paving mixers to charge delivery trucks.

Combine Two Types of Concrete Delivery

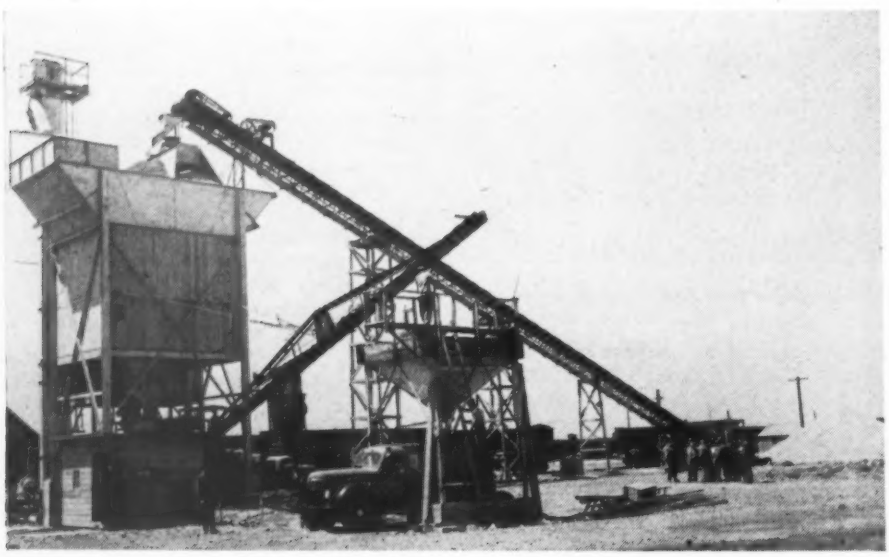
BOTH non-agitating and transit-mix bodies are operated by Corbetta Construction Co., Chicago and New York City, to deliver ready mixed concrete to a large housing project near Chicago. One batching plant with two weigh batchers charges two types of concrete delivery unit. By means of a flop-gate, one batcher supplies either of two concrete mixers serving the non-agitating equipment, while the second batcher proportions cement and aggregate to the transit mix equipment. A single belt conveyor elevates aggregate to overhead bins, and one bucket elevator delivers two types of cement to the combined plant.

Erection of this batching plant was made feasible by the immensity of the job, which includes pouring foundations as well as pre-cast porches for over 3000 units, consisting of residential as well as commercial buildings. The development has been laid out in two parts, with the first part calling for erection of 3010 dwelling units of one and two-story design, together with adequate stores, churches, schools and other necessary community adjuncts. It has been estimated that 80,000 cu. yds. of concrete will be placed in 1½ years to complete the first half of the contract. In the words of Philip Klutznick: "We aren't interested in houses alone—we are trying to create a better life for people. In our view, we will have failed if all we do is produce houses."

Aggregates for the batching plant are delivered by rail and dumped to a 14-cu. yd. track hopper from which material is reclaimed by a 24-in. transfer belt, 20 ft. centers, that discharges to the main plant conveyor, a 24-in. belt on 191 ft. centers. The main belt elevates the materials 55 ft. to a turn-head spout above a 3-compartment overhead bin of 150-cu. yd. total capacity. Only three sizes of aggregate are required.

A storage hopper, containing two compartments of 50-cu. yd. capacity each for sand and gravel, is located over the lower end of the main plant conveyor. This bin is filled by a clamshell either from gondola cars or from storage piles that are located on the opposite side of the rail siding. A manually controlled gate allows the material to fall from the bin to the plant conveyor as needed. Two stockpiles are also maintained as stand-by reserves with each containing 900-cu. yd. of sand and gravel.

Both air-entraining and high-early-strength bulk cements are used at this operation. Cement is delivered by either rail or truck, with the screw conveyor from the track hopper passing beneath a built-up ramp so that it may also receive the truck discharge. This system allows for great flexibility in a plant that uses 700 bbl. of cement in a normal 8½ hr. day. The screw conveys cement to a bucket elevator, 65 ft. centers, which discharges to a swing-spout for diversion to either of two tanks, depending on the type of cement. These tanks serve separate weigh batchers, one for high-early strength cement going to the transit-mix truck, and the other for air entraining cement batched to concrete mixers for delivery to non-agitating type trucks. Total cement storage at the site is 750 bbl.



Batching plant with a capacity of 600 cu. yd. for Park Forest project, Corbetta Construction Co. Sand and gravel move up inclined belt to the right to batching plant. Cement elevator is shown to the left

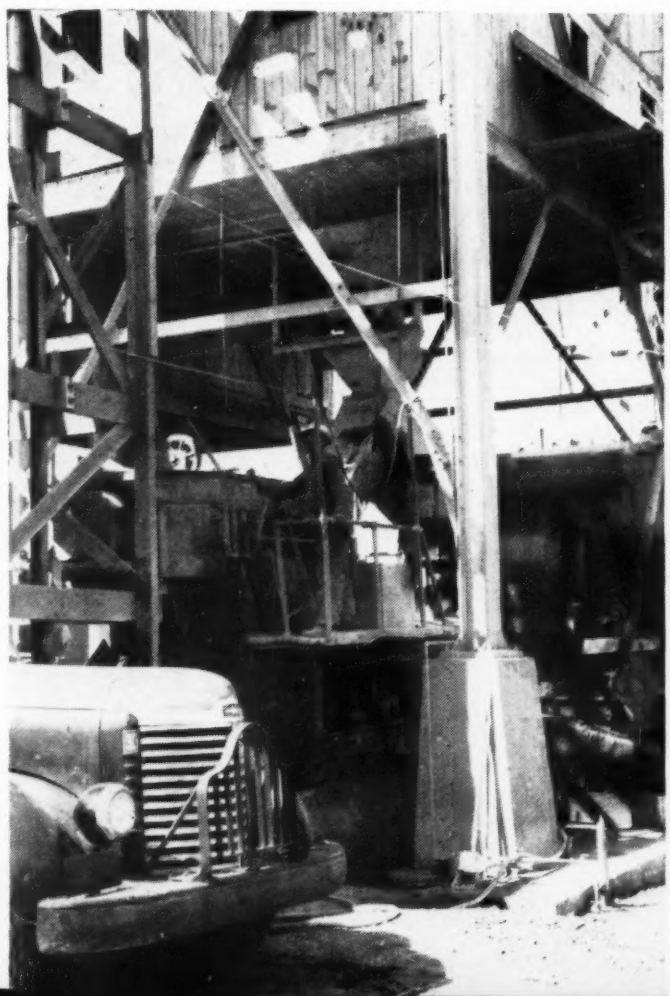
All overhead bins and both weigh batchers are of Butler Bin Co. design. A four-arm weigh batcher proportions sand, gravel and air-entraining cement to two Foote Brothers stationary mixers: a 34-E and a 27-E. Both mixers are charged with a 1 1/10-cu. yd. mix, and dump to concrete buckets which elevate the material to separate 11-cu. yd. hoppers erected over truckways. These hoppers, fitted with manually controlled clamshell gates, discharge to Dumpcrete non-agitating type bodies for the ½-mile haul to the construction site where foundations are being poured. All seven trucks in this operation have 12 in. of sheet steel welded around the top of the dump body, permitting 5-cu. yd. to be carried in 4-cu. yd. bodies. All non-agitating type bodies are mounted on International KB-8F dual-wheel-drive chassis.

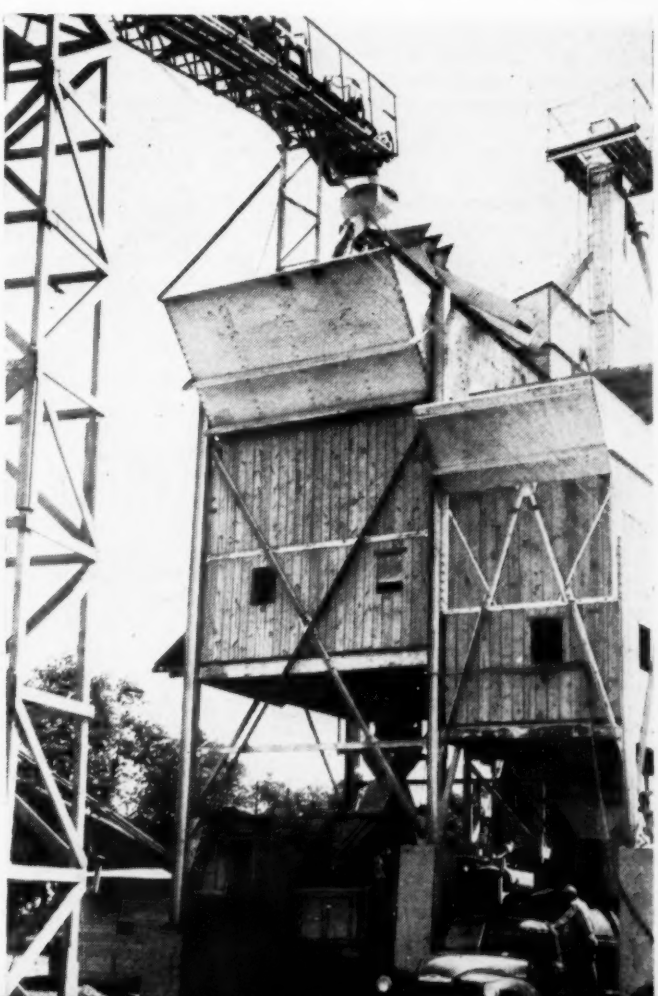
Transit mixer discharging concrete into mold for precast concrete porch section.

High-early strength cement and aggregate is proportioned by a two-arm weigh-batcher and dumped to a 2-cu. yd. Smithmobile transit mixer for a 100-yd. haul to the precasting yard located next to the batch plant. The transit mixer is mounted on a 2½ ton Chevrolet chassis. Precast units include several different porch designs ranging in weight from 575- to 6750-lbs.; and also part of a basement wall that is designed to carry a large picture window. Reinforcing mesh for the various precast units is formed on an air-operated machine of the contractor's own design. Forms used in the precast yard are made of Met-l-wood, and are mopped with castor oil before each use.

Precast units are removed from the forms after 19 hrs. by raising the unit with a large screw jack. All forms are located on a platform about 24-in. above the ground to allow room for the jack. A driveway extends along all four sides of the platform, allowing the transit-mix truck ease of access. Different types of molds total 44, with about 75 separate forms in constant use. After pouring, all forms are internally vibrated with a portable electric vibrator. All pre-cast units are loaded to trailers or placed in a stockpile in the precast yard by a 7-ton capacity Manitowoc Speed Crane, Model 2000. This crane lifts the green units immediately after stripping by means of a vacuum attachment that grips the unit to be hoisted. The vacuum lifting device makes the time consuming job of placing slings around slabs or taking the chance of marring them with grapples, unnecessary. The I-beam attachment was fabricated by the contractor, and the vacuum machine is rented

Left: Batching plant of Corbetta Construction Co. with two concrete mixers. Right: A 2-cu. yd. transit mixer receiving a load of concrete. Dump body units of 5-cu. yd. capacity also are used





Louis Corbetta, secretary-treasurer and general superintendent of project

from Vacuum Concrete, Inc., Philadelphia, Penn.

Vacuum is applied to the precast units by means of two 6-in. steel I-beams faced with sponge rubber, with size of the complete member and number of suction points depending upon load to be lifted. A rubber suction hose attached to the assembly has sufficient slack to travel with the member as the crane lifts the unit and places it in adjacent stockpile or on a semi-trailer spotted near the operation. Each suction channel can be controlled individually by means of manually controlled petcocks on top of the I-beams. Five semi-trailers are kept in constant use, with two tractors pulling them from the precast yard to the construction site. When a loaded trailer is spotted at one end of the run, the tractor is unhitched and attached to another for the return run.

Rigid control is exercised in the mixing and pouring of concrete at this job. Mixes were designed by the Robert W. Hunt Co., with specification for the high-early strength concrete to withstand 2500 p.s.i. in 24 hr. and 6100 p.s.i. in 28 days. Mixes for the two types of cement used at the construction site follow:

28 Day Test Strengths

Air-entraining cement, 2500 p.s.i., foundations		High-early strength cement, 6000 p.s.i., pre-cast units
1.00-cu. ft.	cement	1.00-cu. ft.
1.96-cu. ft.	sand	1.41-cu. ft.
3.01-cu. ft.	gravel	2.04-cu. ft. (pea gravel)
5.12 gal.	water	4.85 gal.

Average test strengths obtained are 2600 and 6100 p.s.i., respectively. One percent $CaCl_2$ is added to the mix in cold weather, yielding the same test strengths. Corbetta Construction Co. contracts with the Robert W. Hunt Co. for testing cylinders every two hours, and daily sieve and moisture analysis. A resident engineer of the testing company uses a Tinius-Olsen hand operated hydraulic compressive strength testing machine at the site for determining crushing strength of cylinders made with the air-entraining concrete. A slump test is conducted every two hours. American Community Builders employs the Walter Flood laboratories to test cylinders for compressive strength.

Louis Corbetta, secretary-treasurer of Corbetta Construction Co., is resident project manager. Kenneth E. Miller is concrete plant superintendent and Bob Vaughn is resident testing engineer for the Robert W. Hunt Co.

Kenneth E. Miller, ready mixed concrete plant superintendent, Corbetta Construction Co., left, and Bob Vaughn, resident concrete control engineer

Non-Agitating Type Haulage Units For Premixed Concrete

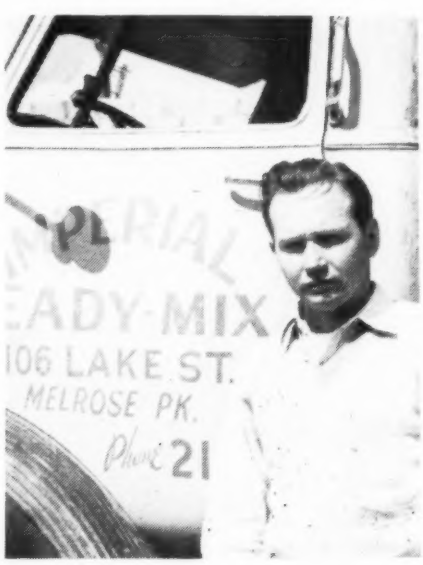
A NEW ready mixed concrete plant, employing ten non-agitating type bodies for pre-mixed concrete delivery in the Chicago area, has been recently erected by Imperial Ready-Mix Concrete Co., division of Imperial Flooring and Waterproofing Co., at Melrose Park, Ill., a suburb of Chicago. Forerunner of this plant was the parent company's portable concrete plant that was moved from job to job in pouring large industrial concrete floors. Most of this work consisted of pouring only the finishing coat, with the base slab being laid by a concrete contractor.

The portable plant was adapted to central, pre-mix operation by the addition of a weigh-batch system, and operated six months: "Partially to test out the idea of ready-mix in Chicago, and also to obtain production while the new plant was under construction," according to Ralph Oury, general manager at the plant. Nucleus of the first plant is to be sold and it is reported that a Mexican firm is interested in the possibility of moving it to Mexico City, D. F.

Erection of the new plant was completed in four months, mainly due to the fact that much scarce equipment was designed and fabricated in company shops. The plant proper is a reinforced concrete structure supporting overhead bins for cement and aggregates. Directly beneath the bins is a floor given over to weigh-batching, and on the next lower floor there is one tilting mixer installed, with a second on order. Trucks to be loaded are driven through a passageway below the mixer floor. A paved highway fronts the property.

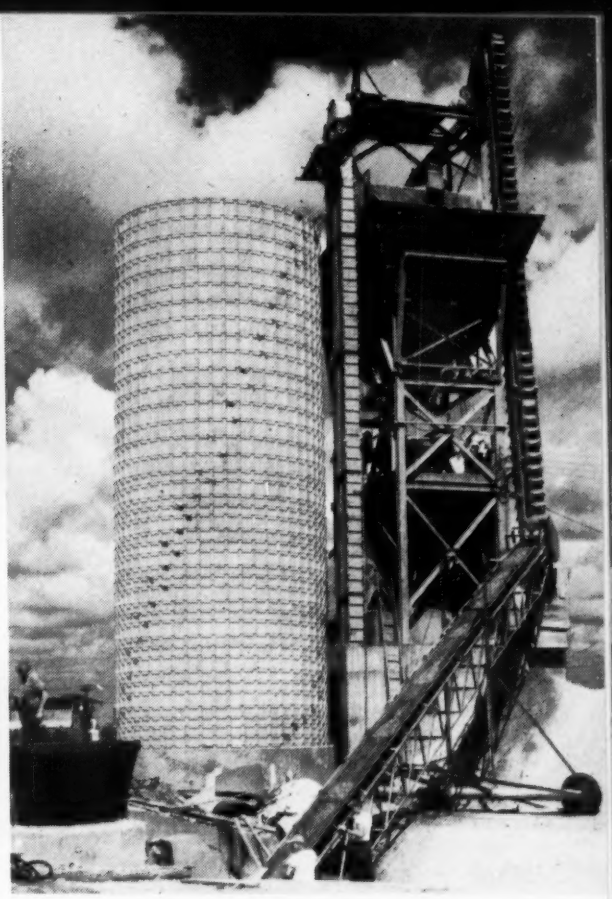
One 24-in. belt, 20 ft. centers, reclaims aggregate from both a track hopper and a truck hopper located immediately adjacent to the railroad tracks. By this arrangement of hoppers, a truck may dump aggregate without interfering with a bottom dump railroad car that previously had been spotted over the track hopper. The 20 ft. collector belt transfers aggregate to a 24-in. swing belt, 60 ft. centers, mounted on a rubber-tired A-frame, with an operating radius of 145 degrees. This swing belt may be used for stockpiling aggregates, or it may convey material directly from receiving hoppers to the plant elevator, which discharges to overhead bins for live storage. Total overhead bin capacity is 55-cu. yd.

Stockpiled aggregate is reclaimed by a 1½-cu. yd. Lull Shoveloader, a front-end loader mounted on a rubber-tired tractor, which dumps to the truck hopper for elevation by belt conveyors to the plant. This system is to be changed in the immediate future when added mixer capacity will require a greater tonnage of aggregates delivered at the plant. Elevation of aggregates to overhead bins will be accomplished by a 200 ft. Barber-Greene conveyor that will connect directly with a track-truck hopper combination similar to the first. This conveyor is



Ralph Oury, general manager of Imperial Ready Mixed Concrete Co.

A 5-cu. yd. Dumpcrete body leaving batching and pre-mixing plant of Imperial Ready Mixed Concrete Co.



Truck hopper at Imperial plant may be seen to the left. Swinging belt conveyor may either be lined up to load elevator or may be swung in 145-deg. arc for stockpiling. Note batching plant, to the right; and stave silo, to the left

Reclaiming from stockpile with tractor-mounted shovel and dumping to truck hopper over belt conveyor below track level, Imperial Ready Mixed Concrete Co.

being constructed at a greater distance from the plant than the present installation to allow the proper grade for the belt. The present hopper and swing belt system will continue in use for summer stockpiling of aggregate to be used in winter months.

Bulk cement discharged from covered hopper cars, is moved by a 25 ft. screw conveyor from the track hopper to a bucket elevator on 65 ft. centers. A swing-spout at the head of the bucket elevator directs cement either to a 200-bbl. overhead bin or to a 1600 bbl. concrete stave silo for storage. This silo is located directly over the screw conveyor connecting track hopper to bucket elevator, and flow from the silo to screw is controlled by a manually operated gate.

A 3-cu. yd. dial-scale weigh batcher is used, with water proportioned by a Neptune flow-meter. At present only one 3-cu. yd. mixer is located on the mixer floor, but a 3-cu. yd. Smith tilting mixer is on order. When the second mixer is installed, both mixers will be served by the one weigh-batcher and water flow-meter. With only one mixer in operation, 10 Dumpcrete (non-agitating type) bodies are kept busy; five, 3-cu. yd. capacity and five of 6-cu. yd. capacity. Trucks on which the Dumpcrete bodies are mounted were formerly owned by the company, but by selling the trucks to the drivers and placing concrete delivery on a contract-haul basis, the company is experiencing far greater pours per day.

Concrete mixes used at the plant were designed by the Pittsburgh Testing Laboratory; and tests are run periodically by all commercial testing laboratories in the area as well as by railroad and state highway testing departments. A 5½-bag mix attains 2900 p.s.i. strength in seven days, a 5-bag mix attains 2352 p.s.i. in seven days and 3600 p.s.i. in 28 days. Advertising is confined to local newspapers, with a breakdown of sales generally following these lines:

50 percent: large commercial construction
30 percent: contractors (for home construction)
20 percent: Individuals (small pours)

The company poured 4700 cu. yd. of concrete in the first full month of operation. When the second mixer is installed, the conveyor belt for aggregate delivery to overhead bins is complete, and the delivery truck fleet has been expanded, it is expected that 1500 cu. yd. of concrete will be placed daily.

A particularly advantageous site was chosen for the new plant from several standpoints, chief of which is access to excellent railroad facilities. The plant is located adjacent to a main line of the Chicago and Northwestern Railroad, and on land leased from the carrier. At this particular point, all tracks are 6 ft. above grade, facilitating track-hopper installation and proper track grade for gravity car movement. Bulk cement (5 percent air-entraining type) is on a straight over-night haul from one direction, while aggregate comes a distance of 20 miles in a straight haul from the opposite direction. Truck haul of aggregate from source to plant is four miles.

Use Fly-Ash As Concrete Additive

AN UNUSUAL, smoothly functioning, three-stop batching plant has been erected by John Griffiths & Son Construction Co., Chicago, for concrete to be poured in foundations, floor slabs, walls and tunnels of a large power house installation on the south side of Chicago. The batching plant is expected to be in operation three years in order to complete the concrete pouring contract. Consisting of three separate weigh-batch plants in a straight line, about 20-ft. apart, a 2-cu. yd. transit-mix truck can be loaded out every 30 seconds. This installation differs from the conven-

tional ready mixed concrete plant in the three-stop arrangement, but since it is a contractor's job, future use of the three separate units was taken into account when the plant was designed.

At the first stop, transit mixers are charged with sand, gravel and water. Overhead bins at this station are filled by clamshell, due to the particular storage problem encountered. The second stop is for adding cement to the drum-type trucks, and the last stop is for the addition of fly-ash. The last two weigh-batch plants are identical, and delivery of both fly-ash and cement is made in covered hopper cars.

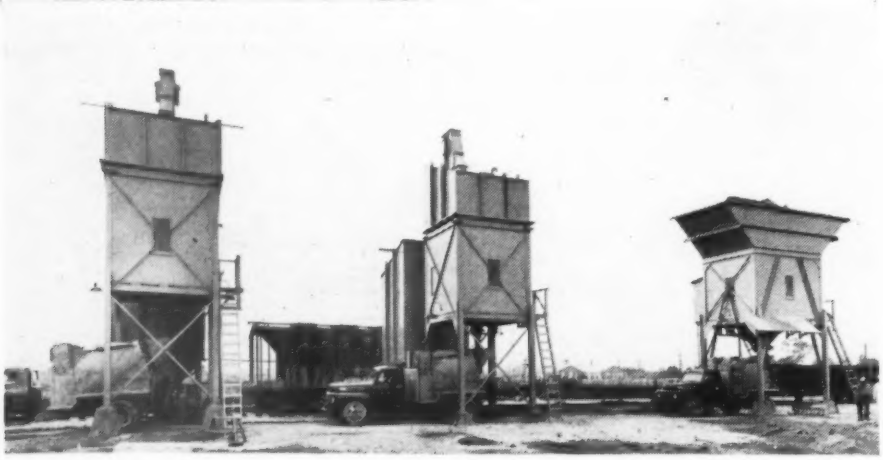
Fly-ash is introduced into the mix in substantial quantities in the interest of conserving cement. By using fly-ash, a 6-bag mix designed for 3000 p.s.i. strength in 28 days requires only four bags of cement to obtain the same test strength, according to the contractor.

Aggregates are unloaded from gondola cars and placed in stock piles by a 1½-cu. yd. Manitowoc clamshell with a 65-ft. boom in a 200-ft. square space that lies between the tracks on which aggregates are received at the plant. A smaller crawler-mounted clamshell, frequently placed on top of the aggregate piles, aids in the movement of material in the large storage area. A Caterpillar dozer is used in the stock yard for aggregate moving and cleanup. A second 1½-cu. yd. clamshell, similar to the first and powered by a Diesel engine, elevates the aggregate to the overhead bins that have a total capacity of 100 tons.

Frequently as many as four clamshells are in use in the storage area at one time. One of the large cranes from the storage area is also used in the pouring operation to shift concrete buckets up or out to forms as needed. Due to severe winter conditions in this area, it is planned to stockpile sufficient aggregate at this site during summer months for cold weather operation so as to avoid the problem of unloading frozen aggregate cars. Stockpiles are expected to contain 200 carloads of sand and 300 carloads of natural gravel, sized to minus 1¼-, plus ½-in., by the time cold weather sets in.

Plans for combatting winter weather, in addition to the aggregates stockpile system, include introduction of steam coils and jets into the aggregate bins and the placing of an electric heater in the 200 gal. water tank at the first station. Water is proportioned to the mix by weight. Moisture caused by the introduction of steam into the aggregate bins or by excessive rainfall in the stockpile area will be compensated for by both lessening the water content of the mix and increasing the amount of sand in a direct pound for pound ratio. A four-beam scale registers aggregate weights.

The second stop for charging mixer trucks is made under the cement batcher. High-early strength bulk portland cement is delivered by rail on a siding alongside the plant. Cement is reclaimed from a track hopper by an 8-in. screw conveyor on 16-ft. centers which transfers it to a bucket elevator on 40-ft. centers for elevation to the overhead bin of 200 bbl. capacity. An overflow pipe from this bin connects to a 400-bbl. ground storage bin located directly over the screw conveyor from the track hopper; flow from the ground storage bin to the conveyor is controlled by a manually operated gate. The third station, where fly-ash is added to the mix, is identical to the cement batcher. Fly-ash is delivered to the plant from Combustion By-Products Co., Chicago, in covered hopper cars. Both cement and fly-ash are proportioned by two-beam weigh batchers. Compressed air is introduced into overhead bins near the throat at both of the last two stations in the usual manner to lessen arching. Fly-ash is naturally sized to 95 percent passing 325-mesh. Bins, elevators and weigh-batchers are packaged units recently introduced by Blaw-Knox Co. Eight 2-cu. yd. transit-mix bodies used at this operation are also of Blaw-Knox manufacture.



Three-unit batching plant used on big power construction job. To the right is aggregate bin; center, cement batcher; and fly-ash additive, to the left

Two different mixes are batched at this job: one of 3000 p.s.i. compressive strength design, used for caissons; and the other of 3750 p.s.i. compressive strength design, used for floor and wall slabs. Proportions of these two mixes follow:

Expressed in Pounds

3000 p.s.i.		*3750 p.s.i.*
2992.8	sand	2824.0
3892.0	gravel	3816.0
752.0	cement	940.0
150.4	fly-ash	188.0
437.0	water	454.5

Rigid control of concrete being poured is exercised by the firm for whom the work is being done, with four test cylinders being made from each pour; i.e., each caisson, floor slab, etc. It was discovered when the job was first started that the concrete was yielding a much higher test strength than was required, and subsequently the amount of cement was reduced to present amounts.

The eight transit-mix bodies are mounted on Ford F-6 trucks. Average haul from the batching point to the construction site is approximately ½-mile. It is expected to pour as much as 100 t.p.h. of concrete in later stages of the job, possibly requiring the addition of two more transit-mix trucks. H. L. Stoneburner, Jr., vice-president of John Griffiths & Son Construction Co., is project manager. J. Keevers is superintendent of the batching plants.

Pumicite Development

CHANDLER AND LEWTON, Santa Margarita, Calif., announce a new use for pumicite, or volcanic ash as opposed to pumice, which is used in expanded form as a lightweight aggregate. Prof. J. Sheldon Carey, University of Kansas, Lawrence, Kan., has conducted successful experiments with pumicite as ingredient of glaze for ceramic products, creating an expanded market for volcanic ash.

Eastern Perlite Expansion

PERLITE MANUFACTURING CO., Carnegie, Pa., has been formed to process and distribute perlite as a lightweight aggregate, as announced by T. C. Ward, Jr., president. Raw perlite is imported from the Rocky Mountain region, pulverized and expanded in a furnace with 110-cu. ft. of expanded perlite capacity per hr. The plant's entire output for the first three weeks has already been contracted for, as this white, lightweight aggregate is in great demand by concrete product producers.

Shop Addition

LONE STAR CEMENT CO., Houston, Tex., announces construction of a shop addition to its present building, at a cost of $29,000.

Cinder Block Producers Hold Meeting

Atlantic City Meeting discusses cinder crushing, staining, value of cubing, and merchandising problems of the industry

PRODUCERS of cinder block met at Hotel Claridge, Atlantic City, N. J., August 9 to 11, in what H. H. Longenecker (Building Units Inc., Philadelphia, Penn.), temporary secretary, termed "a conference, not a convention." This meeting grew out of the desire of cinder block manufacturers to get together and discuss their own particular problems, as opposed to general block producer meetings held under auspices of the National Concrete Masonry Association at New York City earlier in the year. This meeting had no connection with any antecedent cinder block association.

There were about 40 in attendance at the business meetings, which were confined to three-hour periods in the morning. No definite program had been planned, but rather discussion topics were listed for the day, with a chairman and discussion leaders. Floor participation was active, due to the fact that the group was small and a high percentage of those in attendance were known to each other.

The first day, with Elmer K. Geist as chairman, the topic under discussion was machinery, both new and adapted. Allan C. Miller, Cinder Block & Material Co., Indianapolis, Ind., spoke of the recently introduced Swenson cinder pulverizer that was an ideal unit for secondary crushing of cinders. The subject of car-shakers was brought up, but it was felt that the purchase of an adequate car-shaker was not economically feasible for the average block plant. The technical processes of block machine speed-up were also discussed, with particular emphasis being placed on method of concrete feed to the mold box. Haakon Paulson, Besser Manufacturing Co., spoke of the automatic height-limit switch that will be introduced shortly for Vibrapacs.

H. H. Longenecker, Building Units, Inc., Philadelphia, Penn., left and E. H. Brooke, National Brick & Supply Co., Inc., Washington, D. C.

Cubing Block

Value of cubing or palletizing; types of lift trucks and forks; breakage and costs; all were part of a lively discussion. Louis G. Imperato, H. W. Bell Co., New York City, stated: "We palletize 100 per cent—it speeds cubing, speeds deliveries, saves space, and does away with breakage. What we save on breakage pays for the pallets." It should be pointed out that problems of this company do not necessarily apply to others; i.e., high land cost in New York City makes four-high cube storage a must; deliveries of block are primarily to dealers, who have their own lift trucks to unload a truck of palletized block; and a lift-truck operator is paid $14.08 per 8-hr. day. Special cubing made possible by use of a Schmidgall fork was the subject of a moving picture shown by Sam Paturzo and son Victor of V. Paturzo, Brother & Son Co., Baltimore, Md. This company cubes all sizes of block, including special shapes, experiencing 1/10 of one per cent breakage.

Tuesday was devoted to the subject of cinders: their source, condition, age, and whether from anthracite or bituminous coal. The chairman at this session was J. H. Kerrick, Berks Building Block Corp., Reading, Penn., and the discussion was led by Dr. R. C. Johnson, vice-president and director of research, Anthracite Institute and E. J. Kerr, manager technical service, Baltimore & Ohio railroad, Baltimore, Md. It was brought out that cinders used for aggregate must be made from completely burned coal in order to lessen staining, which is mainly caused by iron and unburned coal in cinders. Iron in cinders is in the form of FeO_2.

E. W. Dienhart, executive secretary, N.C.M.A., stated that the association was conducting research on the use of fly-ash as an additive in the manufacture of concrete block. The statement was made at this meeting that cinder block producers were growing fewer and fewer, as more block producers turned to fly-ash.

The question of moisture determination in cinders was brought up, hand in hand, with the opinion of experts that in order to avoid "pop-outs" and stains, it was necessary to store cinders before use for a minimum period of ten days and preferably longer.

Merchandising

On the last day of the meeting, Wednesday, Herbert J. Vincent, Cinder Block Inc., Detroit, Mich., was chairman, assisted by discussion leaders Fred W. Reinhold, Anchor Concrete Products, Buffalo, N. Y., and Herbert Geist, Geist Coal & Supply Co., Cleveland, Ohio. The subject was merchandising. Mr. Geist led the first period by stressing the fact that: "The block producer must capture the imagination of the buying public." He continued by saying that his company does not make concrete, cinder or light-weight block—but only "Geistone."

Mr. Reinhold emphasized the point that the block producer must "make his novelty or good will advertising

Left to right: Mrs. E. K. Geist and daughter; Mrs. E. Fellabaum; Mrs. Helen Hermelink, a friend; and E. Fellabaum, Peerless Cement Products & Supply Co., Charleston, W. Va.

From left to right: Walter Horn, Cinder Block, Inc., Detroit, Mich., E. K. Geist, The Geist Coal & Supply Co., Cleveland, Ohio; and Herbert J. Vincent, Cinder Block, Inc.

E. U. Boggs, Boggs Cinder & Concrete Products Co., Inc., Danville, Va., left, and Richard Bowman, Harrisburg Building Units Co., Harrisburg, Penn.

pieces contain *quality*—cheap pieces make the public think that the manufacturer's block also fall apart." He continued by taking up the matter of advertising in trade papers and local newspapers, particularly farm papers. The amount of good that is done by farm paper advertising had been measurable in a recent building trades union strike in Buffalo, according to Mr. Reinhold. While all construction in the city was at a standstill, and competitive block producers stocks

Louis and Jack Freedman, Massachusetts Cement Block Co., Boston, Mass.

were piling up, Anchor Concrete maintained almost normal sales through country outlets. The amount of benefit to be derived from a Home Show when a block producer displays an actual block house was mentioned by several members present.

Because the business sessions were finished by 1:00 each afternoon, there was ample time left for acquiring a tan on the beach, and many present tried hard for all three days. Wives and families of producers were very much in evidence, and particularly at the banquet held Tuesday afternoon in the main hotel dining room. As the conference closed, it was the opinion of all present that it had been a success, and that a similar meeting should be held next summer. When and where to hold next summer's meeting is to be decided at a special meeting of the cinder block producers sometime during the annual N.C.M.A. convention, to be held at Cleveland next January 31 to February 3.

Furnaces to Produce Expanded Aggregates

ALEXITE ENGINEERING, Division of Alexander Film Co., Denver, Colo., in several years of research in the perlite industry, has built and used several types and sizes of expansion furnaces to produce PerAleX. Customers at great distances, cannot buy PerAleX profitably, however, due to the high freight cost on expanded aggregates, so it is suggested by the Alexite Co. that they buy classified ore and expand it in their own furnaces. The Alexite company's principal furnace at present is fire brick lined and turns out 100 to 160 cu. ft. of high grade plaster and concrete aggregate per hour. But maintenance is high, and the installation would cost about $40,000 to duplicate. Therefore it is not recommended.

Designs have been completed for a lighter furnace with a rotating drum of high heat-resisting metal that is estimated to be of greater capacity and efficiency which should not cost more than $40,000 complete in operation. The company also has been watching the operation of a smaller furnace near Denver that is turning out an 8 lb. per cu. ft. plaster aggregate from PerAleX ore.

The furnace, according to the owner-operator, can be built and shipped within a month after order is received. The plant is simple in construction and is built and operated in units. A 1½ cu. yd. ore bin or hopper sets high and is filled from an elevator which is motor driven and takes ore from floor level or from a pit. One ore bin will feed ore to one, two or three furnace units. A unit is a revolving metal tube, refractory lined, with a burner in the intake upper end. Expanded aggregate drops from the lower end into a drum and is carried by air suction up through metal pipes through two cyclones. A sacking bin is below each cyclone. Each unit has two motors: one to revolve the tube or drum and the other to provide a vacuum.

California Cement Companies Ship F.O.B.

CEMENT COMPANIES in California, endeavoring to conform to the recent Supreme Court decision abolishing the multiple basing point system of pricing and marketing cement, generally are setting prices of around $2.95 to $3.00 a barrel f.o.b. mill in paper sacks, plus actual transportation charges from mill to destination, a report states. In cases where companies operate more than a single cement plant, there is usually some difference in the mill price at the different plants. Cash discounts, where in effect previously, still obtain.

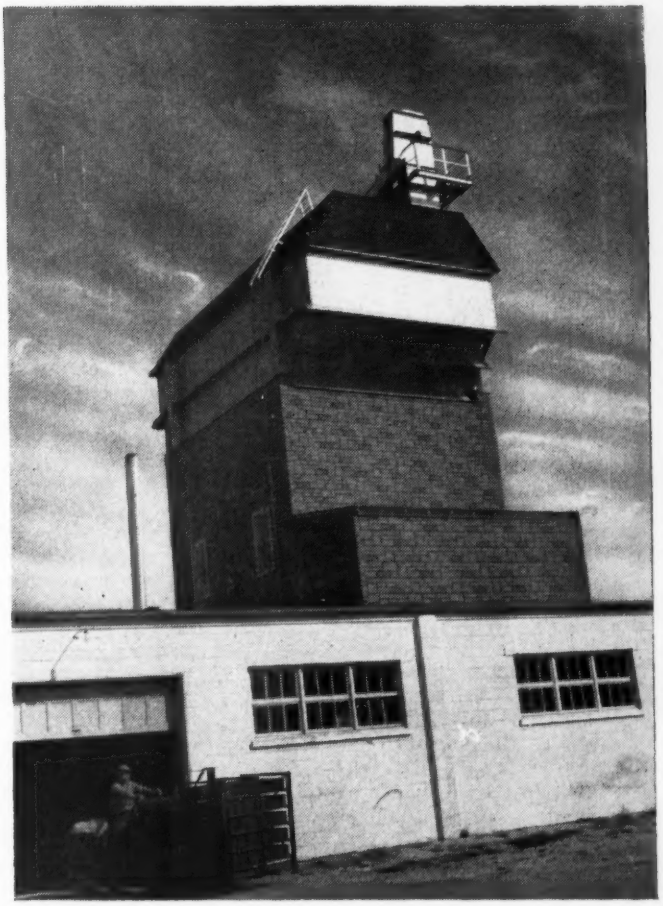
One Northern California firm quotes a price of $2.55 per bbl. in bulk and $2.95 per bbl. in paper sacks for its regular type cement, plus actual transportation costs. It points out that buyers may elect to purchase cement on a delivered price basis and specify rail or truck delivery, all delivery costs to be borne by the consumer. The company will continue to make arrangements for truck deliveries to render efficient service to its customers.

Left to right: Jack Franklin, Haakon Paulson and wife, and J. J. Staley, all of Besser, and Sam Corson, Hatboro Concrete Block Co., Hatboro, Penn.

Design Plant Layout For Future Expansion

Arlington Concrete Products Co., Arlington Heights, Ill., provides for gravity flow of aggregates and cement. Large percentage of production sold to farmers and for industrial construction

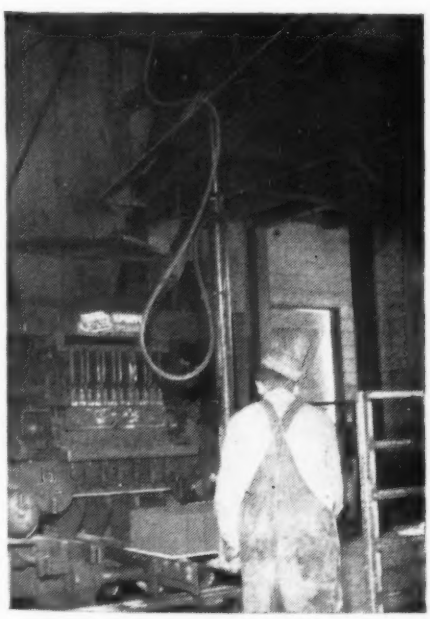
By DAVID MOCINE



Aggregate and cement storage bins with concrete products plant below. Elevator, above, is used to move aggregates into bins. An inclined belt conveyor with prongs to hold sacks is used to elevate cement to the mixer platform

IDEALLY SITUATED from the standpoint of a widely diversified market, Arlington Concrete Products Co., Arlington Heights, Ill., is located 30 miles north of Chicago. This area, until recently, was almost wholly given over to farming, but is now being encroached upon by industry, principally because it provides room for expansion that is lacking in the city. These new industrial buildings are preponderantly of the one- or two-story design which readily lends itself to block construction. There is also a market for the expanding urban housing required by the larger population; and the necessary commercial buildings to cater to the residents.

Despite the enlarged industrial and commercial aspect of the area, the market provided by the many prosperous farms forms another important outlet for block. These farmers have been well educated in the use of block for almost every construction job on the farm, including hog and poultry houses, dairy barns and milk houses, bull pens, barn foundations and implement sheds, plus scores of other uses. Of the company's total output, 40 to 45 per cent is taken by the farm market. Farmers call with their own trucks for about 30 per cent of plant production, while the remaining 10 to 15 per cent used on farms comes from the 70 per cent sold to contractors.



Pneumatic off-bearer for removing block from machine to racks

Market protection is practiced through shipping block to local contractors first; and since demand is greater than supply, particularly in lightweight block, very little of the company's production finds its way out of the immediate vicinity at the present time. All cartage other than block picked up in farm or contractor trucks is handled by a private contract hauler with two 5-ton Chevrolet flat beds.

Designed by Besser Manufacturing Co. engineers, the plant has been laid out to make future expansion possible with the minimum of effort and expense. Additional land is available if needed, and the plant building is large enough to house a second block machine now on order.

Sand and gravel aggregate from the Consumer Company's pit 15 miles north of the plant containing ample fines, is used for heavyweight block, and Haydite is used for lightweight block. If lightweight aggregate were readily obtainable, ratio of use at this plant would be 80 per cent lightweight to 20 per cent sand and gravel, but due to shortages, the ratio is reversed at the present time. Both forms of aggregate are delivered in railroad cars that discharge to a hopper below track level, from which material is transferred by means of an 18-in. belt conveyor, 16 ft. centers, to an enclosed bucket elevator, 80 ft. centers.

At the top of the elevator the aggregate is diverted by a flop gate to one of four 100-ton live storage bins. Material is drawn from the bins to a weigh-batcher and then dumped to a 50-cu. ft. Besser mixer. Aggregate

(Continued on page 161)

Lift truck handles block to storage yard

Reconverting A

READY MIX BUSINESS From War to Peace Economy

Ready Mixed Concrete Co. operates three concrete batching plants in Denver to minimize no-load hauls and speed deliveries; has capacity of 425-cu. yds. per hr. in Denver plus 200-cu. yd. from roving plants

By BROR NORDBERG

First plant of company started operation in 1936

READY MIXED CONCRETE is a relatively new product in Denver, Colo. Practically none of it was used prior to organization of Ready Mixed Concrete Co. in 1936; today, 75 per cent of all concrete poured in the city is ready-mixed and the product is in demand for all manner of construction.

Being the pioneer producer of commercial ready mixed concrete in the area and one of the largest in the Rocky Mountain region, Ready Mixed Concrete Company's business policies have influenced the wide acceptance that the product now enjoys in the rapidly expanding Rocky Mountain area. These policies are simple but strictly adhered to: First, the company will not sell concrete unless it be of high standard; and, secondly, emphasis is on fast and reliable service. Assuming a high-grade product, the company considers that its business will be in proportion to the service rendered. Consequently from the beginning a great deal of time and effort has been expended in servicing construction jobs and in minimizing job delays so as to cut costs for the customer. Production is decentralized so that average length of haul is less than in most operations throughout the country.

F. P. ("BUDD") SPRATLEN, JR., president of the concern, and past president of the National Ready Mixed Concrete Association, was a founder of the company and the man most responsible for starting the movement to ready-mixed concrete in his area. He previously had been in the sand and gravel business since 1920 and was a partner in Spratlen-Brannan, Inc., producer of sand and gravel and supplier of building materials. Budd Spratlen's interest in the sand and gravel business was relinquished five years ago in order to devote his entire time to ready-mixed concrete and the conversion of a vastly-expanded wartime enterprise to peace-time needs.

After fulfilling its first contract, on a large sewage disposal project, the company had in 1937 moved its plant equipment into the city proper and built a commercial business requiring eight truck mixers operating out of two batching plants. Before and during the early part of the war a batching plant also was operated at Lowry Field. Experience gained in the production of aggregates and ready-mixed concrete was turned to wartime purposes in 1942 and 1943 when the company undertook to supply contracts that required as much as 2000-cu. yds. of concrete poured per day and a fleet of 64 transit mixers. Among the major projects were the U. S. Navy Depot at Clearfield, Utah; the Camp Hale ski cantonment near Leadville, Colo.; the McCook airbase in Nebraska; Camp Warren at Cheyenne, Wyoming; Lowry Field in Denver; the Rocky Mountain Arsenal, Denver; Denver Modification Center; Denver Medical Depot; and ordinance projects. Some of these projects, which were under construction simultaneously with others, required pours as high as 1200-cu. yds. per day.

Experience gained in batching and delivering this unprecedented volume of concrete is reflected in operations today as adjusted to peace-time requirements. When operating on a 24-hr. schedule every day of the week, with only brief down time for repair, inspection, and adjustment of equipment, the company had an unusual opportunity to compare performance of practically every known make of mixer, truck chassis, and other equipment. Maneuverability of mobile equipment and points of weakness contributory to early breakdown of machinery were carefully studied in fulfilling a program where every cubic yard of concrete that could be delivered was needed. One of the unique features was the batching of concrete at Camp Hale, two miles up, where the rarefied air required special compression heads on truck engines, and gasoline power for all equipment. That project required a maximum of 1200-cu. yds. of concrete per day and took 38,000-cu. yd.

As many as 56 truck mixers were rented and in service together with 22 company-owned units at the peak of this war construction. At its conclusion, excess equipment was disposed of and the company reconverted into its present holdings, which include three batching plants in Denver, with

Plant No. 2 in West Denver utilizes belt conveyors for handling aggregates

18 new transit mixers as compared to eight pre-war, and two smaller "roving" batching plants that serve outlying jobs. One of the portable plants is now at Rapid City, S. D., supplying concrete for construction of the largest airplane hanger in the world. The batching plant from Cheyenne, Wyo., was moved to Denver and set up as an additional unit at the main plant.

Plant Facilities

Plant No. 1 is the main plant and is located at 32nd St. and Brighton Blvd., just one mile from the center of Denver. It is near the main office and the company shop, and consists essentially of a 4-compartment bin with 350-tons capacity for aggregates (2 sand and 2 gravel), a 4-cu. yd. weigh batcher and cement bins that hold eight carloads. This plant has a 100-hp. stoker-fired boiler for winter operation. Its capacity is 150-cu. yds. of concrete per hour. Adjoining it is an auxiliary batching plant that can batch 100-cu. yds. per hr.

Plant No. 2 in South Denver is rated at 100-cu. yds. per hr. and the Aurora plant, No. 3, just east of Denver, has a capacity of 75-cu. yds. per hr. The roving plants have a peak output of 100-cu. yds. per hr. each.

Batching equipment is Blaw-Knox in each case, but it is of interest that aggregates are handled differently at each location. As shown in the accompanying illustrations, No. 1 plant is a gravity operation, a belt conveyor is used at No. 2, and a bucket elevator at No. 3 plant. Aggregates are quartzitic gravel and sand trucked from the South Platte river and nearby Clear Creek.

Haulage equipment is being standardized. A 3-cu. yd. transit mixer has been adopted as most flexible and for speed in operation. The fleet consists of 18 Rex high dumps, and the company is now standardizing on Series 700 GMC chassis. Speed, economy of operation, and ease in maintenance were factors considered in selection of the equipment.

The company stresses in merchandising that it has facilities to serve construction jobs quickly and with minimum interruption. Having batching plants decentralized at three locations, the average haul is held to five miles. There is very little no-load hauling, through the practice of having materials batched into a mixer truck at each of the several locations as that truck travels through the city. Thus a given truck may start out in the morning from plant No. 1 with a load of concrete. Its schedule will take it toward plant No. 2 in South Denver where a second load is picked up and delivered on the back haul to plant No. 1. It was of interest to us, in our visit to the operations, that we never saw more than one mixer truck at a time at either plant. They were all busy delivering concrete on this staggered plan of scheduling. Economies so affected, and the resultant speed of delivery, are benefits passed on to the customer.

Completed this year, the Boettcher Crippled Children's School in Denver. Architectural concrete of 8000 p.s.i. compressive strength was used

Responsibility of the company is proved through complete acceptance of its product by the construction industry. According to Mr. Spratlen, once a customer has utilized ready-mixed concrete he rarely has returned to other methods of receiving and placing concrete. Among the types of construction utilizing ready-mixed concrete supplied by the company are industrial plants, airports, arsenals, street and alley paving, reservoirs, schools, churches, cantonments, warehouses, bridges, culverts, hospitals,

F. P. SPRATLEN, III
Vice President

R. A. TIPTON
Sales Manager

C. P. BROWN
General Superintendent

F. P. SPRATLEN, JR.
President

YOUTH, TRAINING, KNOWLEDGE AND EXPERIENCE

READY MIXED CONCRETE COMPANY places at your service *Young*, progressive ideas.

We give you the benefit of sound technical *Training* in concrete engineering.

Our service is based on practical *Knowledge* of concrete, of efficient production methods, and of construction needs.

Ready Mixed Concrete Company is the pioneer producer of commercial transit-mixed concrete in this region. We have wide *Experience* in servicing all types of projects, both large and small: factories, airports, arsenals, paving, reservoirs, schools, churches, cantonments, warehouses, as well as homes. Our experience is not only in the Denver area and Colorado, but in the states of Wyoming, Nebraska, and Utah, as well.

Strategic location of our Denver batching plants gives you maximum service at low cost. Our enlarged fleet of transit mixer trucks is maintained in top working order.

Our aim is to give you excellent concrete at all times, and the best possible service.

We hope to have the privilege of serving YOU on your next job.

READY MIXED CONCRETE COMPANY

Denver Colo.

"Manufacturers of Specification Concrete"

NATIONAL READY MIXED CONCRETE ASSOCIATION

Recent advertisement featuring top personnel and its qualifications. The plant shown is a gravity operation with auxiliary plant on left

Plant No. 3 at Aurora in East Denver was moved from Cheyenne, Wyo., where it had been operated in cantonment construction. It employs bucket elevators for handling aggregates

housing, curbing, silos and architectural concrete. One of the illustrations herewith is of architectural concrete of 8000-p.s.i. compressive strength. Mixes for such special projects are developed through research in co-operation with architects, engineers, and contractors.

All the concrete sold is mixed in transit and in recent years the trend is toward air-entrained concrete. Pozzolith is added into the batch by dispensers in sufficient proportion to yield from 3 to 5 per cent entrained air. As a result of performance observed with air-entrained concrete, company policy is to sell that product in preference to standard concrete whenever it can.

Teamsters union cooperated in this display of progress in concrete mixing and delivery, the company's part in one of the Labor Day parades in Denver

One of two roving batching plants. This unit is at present batching concrete for the world's largest airplane hangar at Rapid City, S. Dak.

Merchandising

Direct contact constitutes the chief selling effort, supplemented by advertising and participation in civic functions. Several years ago the company had truck equipment in a Labor Day parade to depict progress over the years in methods of mixing and delivering concrete. Its latest truck equipment was contrasted with older style models and out-dated hand mixing methods to show the tremendous progress in efficient mixing and handling.

Most of the advertising is large space carried in the *Rocky Mountain Contractor*. Advertisements are informative. The plants and other facilities are given a play pictorially and, when new equipment is purchased, the news constitutes the theme for illustrated advertising. Services available are given special emphasis and all advertisements signify the company's membership in the National Ready Mixed Concrete Association.

One of the recent advertisements carried photographs of top personnel and emphasized the part each individual has in rendering a unique service to the construction industry. It was headed, "Youth, Training, Knowledge, and Experience." Mr. Spratlen is proud of the fact that he has a staff capable of instilling young, progressive ideas into the business, to back up the experience that has accumulated over the years.

Top personnel include R. A. Tipton, sales manager; C. P. Brown, general superintendent, and F. P. Spratlen, III, who was recently elected vice-president. While comparatively young to assume the responsibilities of a vice-president, Mr. Spratlen's son has the qualifications to go far in the industry. He has the enthusiasm of his father and had been learning the business the hard way all through his school years. He spent summer vacations driving mixer and gravel trucks and, following more than three years of service in the Navy, put in six months as a dispatcher. Young Budd is a graduate in Business Education and Economics from the University of Denver.

One of the fundamental principles that have contributed to the success of the company is sound labor relations. Labor-management meetings are held monthly. Engineers, dispatchers, truck drivers and other key employees are given the opportunity in meetings to talk over problems and offer suggestions for any improvements that will increase efficiency of operations and contribute to general smooth functioning of the business.

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CAMBRIDGE LUMBER & COAL CO., Cambridge, Ohio, has installed a central mix plant for the production of ready mixed concrete.

Mixer truck ready to pull away from batching plant

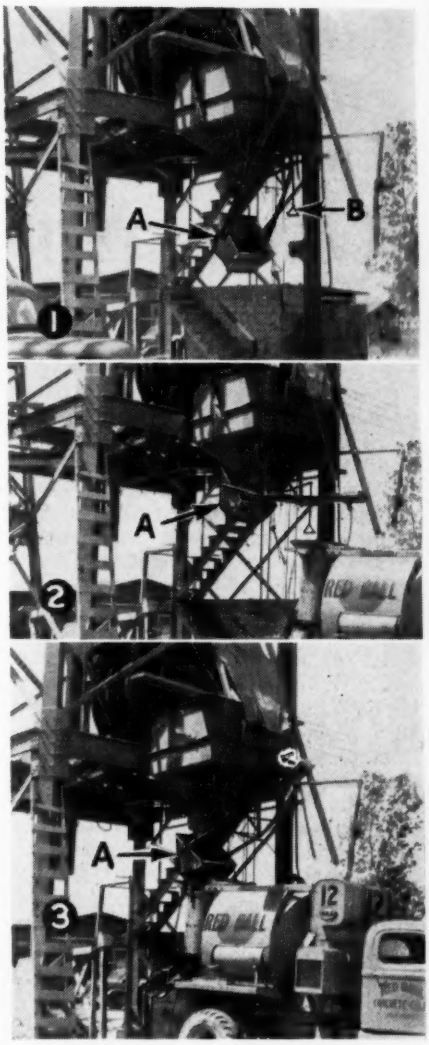
Unusual Method of Loading Agitator Trucks

Red Ball Concrete Co., Inc., Baton Rouge, La., operates 12 agitator trucks

BATON ROUGE, La., has three ready mixed concrete companies and the newest of these is the Red Ball Concrete Co., Inc., located in the southern part of the city and on the Illinois Central railroad. The plant started turning out concrete in July of 1947.

Twelve White trucks, each equipped with Rex 3-cu. yd. agitators, are operated. All the concrete is pre-mixed using a 1-cu. yd. Rex mixer. Pozzolith is used as an admixture. The batcher is a Fanning-Schuette Engineering Co. unit, provided with a 3-beam scale. Over this batcher is a four-compartment bin for aggregate and cement, the latter being handled by bucket elevator. The aggregates are delivered both by truck and by rail, and the track hopper, served by a cross conveyor belt, delivers to a second hopper that is supported above ground elevation. Trucks can dump direct to the track hopper or the Lorain clam shell rig can load the hopper from ground storage piles alongside the assembly. Trucks can also dump to ground storage when desired. This second hopper serves an inclined Robins belt conveyor that delivers to the bins over the batcher. The clam shell can also load direct to an enclosed field hopper as the company also markets (but does not produce) concrete aggregates.

Illustrations show the rather unusual method of delivering pre-mixed concrete to the trucks. One cubic yard of concrete is mixed at a time with the mixer dumping to a steel hopper on the outside of the main structure. A second smaller hopper is swung from two parallel arms that in turn are suspended near their centers, and the outboard end is counterweighted. When the truck approaches the loading section, the pivoted hopper is in the position shown in Fig. 1. At that time the truck operator gets out of the cab and pulls the handle marked "B" which raises the small hopper and locks it so the truck can back under it. Fig. 2 shows how the hopper appears after locking in position. In Fig. 3 the truck has backed into the proper loading position and the pivoted hopper has engaged itself so as to serve as the connecting chute between the hopper for pre-mixed concrete, above, and the mobile unit. A metal tube extends from mixer platform to the lower assembly so the truck driver and mixer operator can talk to each other.



Unusual method of loading agitator mixer trucks. Fig. 1, above: Hopper (A) in position to receive pre-mixed concrete from mixer hopper, above. Operator pulls handle (B) to raise the hinged hopper. Fig. 2: Truck backing under hopper with cone-shaped chute raised to permit truck backing under it. Fig. 3: Pivoted chute in the loading position

In the background may be seen enclosed loading hopper for loading trucks

Reasons for Behavior of

CONCRETE for "Autobahnen"

By OTTO GRAF*

FROM the communications of various American engineers who have visited Germany and from the report of Dr. Swayze it may be assumed that in general, the concrete roads in Germany are in very excellent condition.

Now I have spent much time observing construction of concrete pavements in Germany and have contributed important details of the specifications for that concrete. In addition, having had the opportunity of observing concrete road construction in the U. S. A. in 1936, I feel I have a special interest in trying to evaluate the reasons for the different behavior of the concretes in the two countries. Some of the differences in viewpoint between American and German engineers have been discussed in the journal, *Die Betonstrasse* 1937, page 117 and in *Zement* 1937, page 389. In general, the points of difference are included in the following:

(1) The properties of the cements.
(2) Composition and manipulation of the concrete.
(3) The after-treatment of the concrete.
(4) The minimum and actual strength of the concrete.
(5) The strength change with aging.
(6) Concrete strength properties on opening to traffic; the permissible loading of the road in traffic. (with reference to the road construction; and the climate) and salt application in winter.
(7) An adequate diagnosis of the failures and shortcomings[1].

Cement Properties

It was important that the cements chosen for concrete slabs, with insignificant deviations, should be selected[2]. Their selection followed specifications of a working group of the Institute for Roads *(Forschungsgesellschaft fur das Strassenwesen)*. The writer served as chairman and was also entrusted by the administration of the *Kraftfahrbahnen* with the inspection. The selection of the cements was supported by job experience as well as by specially chosen tests. *Those cements with high flexural strength and small shrinkage were favored, especially those which lost very little of their flexural strength on drying.*

An example, as illustrated in Fig. 1, shows how concrete with cement H(228) lost much less of this strength on drying (retrogression from 900 to 730 p.s.i.) than with cement O(224), which fell from 970 to 570 p.s.i. The former is to be chosen for roads.

Finely ground cement is to be avoided; indeed, the cement should have a minimum of 5 percent residue on the 178 mesh sieve. German cements are appreciably coarser than American cements. The cement on delivery had to withstand the cooking test[3]. The initial setting time was longer than 1½ hours at 30 deg. C. The uniformity of cement quality was closely limited and carefully checked. The testing of the cements in the plant followed special procedure. The seven-day results had to be approved before shipping. Experience has justified these precautions; by means of active exchange of experience and close mutual cooperation of the participants, it was hoped to accomplish a contribution of technical value. In addition, three carefully controlled, large experimental stretches were built with different cements, to determine whether cements, whose properties fell outside our narrow specifications, could be used for roads. In that way we hoped to determine whether the specifications for choice of cements might be abandoned. These experimental pavements are now awaiting further observation; and the suggestion is made to American highway engineers to help prevent this experience from becoming lost.

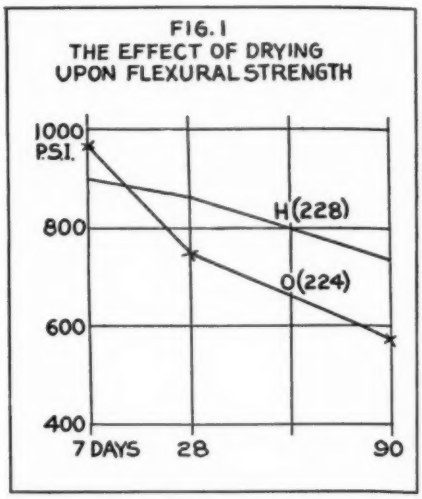


Fig. 1: Effect of drying upon flexural strength

Concrete Composition And Its Application

The most important consideration was concrete strength as discussed in (4). Then the maximum cement content in the concrete, should be held to 6-1/3 bags per cu. yd. The water content was controlled. The aggregate grading was held within the following limits, passing a sieve having openings of:

Millimeters	0.2	1	3	7	15	30
Percent	1-7%	8-30	20-44	40-60	55-75	100%

In many cases the large aggregate ranged to 40 and even 50 millimeters. The aggregate was carefully chosen, not only as to kind of stone, but also with reference to its strength, abrasion loss, durability, particle shape, etc. Natural sands and gravels were preferred. The fine aggregate used (0-3 m.m.) was always a natural sand. Cement and aggregates were proportioned by weight. For the mixing, machines were chosen which had been shown by previous experiments to be most suitable[4]. For convenience in controlling water content and mixing time, special means were provided[5].

Consolidation of the concrete was obtained mostly with either Dingler tamping machines or with Vögele vibrators. Comprehensive experiments had been carried out with such machines. As a result, specifications were adopted for road finishers. With their aid thorough consolidation of an intentionally harsh concrete was secured in such a way that the flexural strength of the upper surface of the slab should equal or very nearly equal that of the bottom and both should be quite high[6]. Finally, care was taken to avoid the accumulation of water on the upper surface of the concrete so that an excess of water was guarded

*Professor of Civil Engineering, Stuttgart Technical High School, and Director of the Württemberg State Testing Laboratory.

1 It is generally recognized that faulty concrete is not caused by a single factor, but by a combination of factors. The significance of this fact is often under-estimated. The following is chosen as an illustration: The concrete of a given highway has only 4/5 of the required flexural strength and 9/10 of the thickness specified. The bending moment, that can be carried by the slab, is only 0.8 x 0.9^2 = 0.65 of the theoretical.

2 Graf, "The Choice of Cement for Concrete Roads and the Development of Cement Testing", **Forschungsarbeiten aus dem Strassenwesen**, Vol. 27, 1940.

3 This test consists in molding about 100 grams of cement to a stiff plastic consistency as a pat, storing 24 hours in the damp closet, and boiling for two hours immersed in water.

4 **Kaufman and Rösslein**, Mixing Experiments, **Forschungsarbeiten für das Strassenwesen**, Vol. 18, pages 11-94; **Garbotz and Graf**, Proposals for Yield and Applications for Specification for Concrete Mixers, **ibid**, Vol. 18, pages 95-108.

5 These points and others have been covered in specifications for the **Fahrbahndecken**, issued in 1934 and 1936, and in the directions for constructing such pavements, issued in 1937 and 1939.

6 The study of a failure of concrete involving two layers of different strengths showed that the carrying capacity of the pavement depended upon the strength of the lower layer as well as upon that of the upper layer.

against. The finishing of the concrete slab should be completed in summer time within two hours after pouring. In this respect the writer has recommended that the final finishing be done as late as possible, in order to produce a maximum of consolidation, after the water of bleeding has been evaporated from the surface, to be exposed later to traffic.

After treatment of the concrete was carefully carried out in accordance with reports of American engineers as modified suitably based on special experiments with materials available in Germany.

Strengths of road concrete were determined continuously on beams and cubes, which were fabricated from concrete on the job and cured in the same manner as the slabs. The requirements were:

	Minimum Compressive				
	1935	1936	1937	1939	
Average	5700	5700	5250	5250	p.s.i.
Single Val.	4700	4700	——	——	
	Minimum Flexural				
Average	570	640	640	640	p.s.i.
Single Val.	470	550	——	——	

Further, before opening to traffic, these were checked with cores bored from the pavement, 15 cm. in diameter and about 22 cm. high. These, tested at 2 months, developed a minimum of 4550 p.s.i., serving as a check on the quality of the delivered concrete[7]. If more than five percent of the core values fell below minimum, the time covered by the contractor's guarantee was extended to five years, while with greater deviations price penalties were imposed. On the whole, attention was given to secure a uniform concrete of good flexural strength and having excellent resistance to the weather and to abrasion. These aims were satisfactorily accomplished, when every detail of concreting was punctually attended to in the application. Otherwise, greater or lesser variations from specified values were unavoidable. Typical results may be found in *Die Betonstrasse*, 1937, number 6, and in the *Strassenbau-Jahrbuch*, 1939/1940, pages 216-220. It is noteworthy that the mean core strengths increased from 4900 to 5900 p.s.i. during the years 1935 to 1938, while the percentage of samples yielding low strengths decreased during this period.

The change in strength with aging is important from two viewpoints. It is very desirable to have an increasing flexural strength, which is more apt to occur with coarse cements than with fine ones. Drying out or saturation of the concrete should not have any great effect on this strength. The corollary investigations supported these ideas that those cements most used in the Autobahnen were satisfactory.

For the loading of the concrete in traffic endeavor was made:

(a) That traffic not be permitted until minimum strength was reached.

(b) To confine the permissible loading according to the design of the particular pavement (slab thickness, nature of base, whether with thickened edges and dowels, etc.)

(c) To permit application of only harmless salts.

In connection with (b) numerous measurements were made, in addition to laboratory experiments, to determine the permissible flexural loading[8]. The strains due to temperature changes were evaluated[9]. The writer concluded from all these experiments that the thickness of the pavement should be 8 in. to safely carry the traffic loads then permitted. Therefore, it seemed desirable to choose a thickness of about 9 inches. Later this was reduced to 8 in. on the assumption that the installation by the workers followed so good a practice as to make this reduction safe. Experience now shows that for the present day heavy traffic at least 9 inches should be specified.

In regard to (c), experience in the U. S. A. has proved that salt application soon damages the concrete. Appreciable damage has not yet been noted in Germany, probably because very little salt[10] is used here.

Diagnosis of Failures and Shortcomings. The observed failures and faults have mostly occurred in concrete roads as shrinkage cracks, map cracks, poor bond between upper and lower concrete, fresh concrete frozen, or as low strength; on no occasion was there any need to change the specifications (1) to (6). In a very few cases choice of aggregate or its proper delivery gave trouble; here also the directions were not completely followed.

The subgrade did not always show the desired effect as to frost action, so that occasionally uneven heaving occurred in winter. In doubtful cases, then, dowels must be used.

Altogether, the failures and faults in the Autobahnen fell within narrow limits.

Supplementary Letter by Prof. Otto Graf

"I had assumed that in the report which you have, the contents were sufficiently comprehensive to provide adequate information concerning the most important parts of our experience. As soon as one goes into details, a much more complete report would have to be written; for example, on the cements for pavements, on cement testing in Germany, etc.

"To answer your questions:

"1. How do you select your cement?—By visits at the cement plants, it was important to determine whether the available raw materials were uniform or not; whether the preparation of a very uniform raw material was secured (kind of installation in the quarry, size of preliminary preparation of the raw material, number and size of the raw material bins, blending equipment, number and type of tests, etc.). The chemical combination was not strictly defined; for instance, as to a lowered content of Al_2O_3 or a higher content of Fe_2O_3. Lower alkali content is customary with us. The chemical composition was limited from case to case based on the experience gained from the laboratory record books, in order to produce cements continuously good according to strength experiments. In burning, a constantly heavy clinker was sought. Each plant made regular weight control tests. The fineness of grinding was intentionally limited, as stated in the report. Coarsely-ground cements with high strength properties were regarded as more valuable than finely-ground cements. No attention was paid to the size distribution of the cement grains.

"2. How did you test your cement?—Cement testing followed German *Norm* 1164, which had been developed by means of numerous researches in paving cements. A mix of one part by weight of cement with 3 of graded fine quartz sand mixed to a soft consistency with a water-cement weight ratio of 0.60 (water-solids ratio of 15%). Temperature was 65 to 70 deg. F. for mixing with the relative humidity above 90%. The mortar was placed in prism forms 4-x-4-x16-cm. lightly by hand with a few light tamps. The prisms were cured one day in damp air, then in water at 65 to 70 deg. F. The prisms were first tested in flexure and the pieces were then compressed. The values from the bending test were regarded as more significant than the tensile test, as being of greater practical applicability. Shrinkage and expansion were tested on similar prisms containing non-corroding inserts. The storage thereof was one day in moist air, six in water, then in a Climate Box of a given size over caustic potash, so that a constant drying condition was obtained. Temperature was in the range of 65 to 70 deg. F.

"3. How did you mix, place and finish your concrete?—A good concrete mixer for paving concrete was proved to be the Swinging mixer of the Sonthofen Huttenwerks, and the 17-cu. ft. (500 liter) free falling mixer by Kaiser in St. Ingbert in the Saar. The time of mixing ranged from 30 to 60 seconds, taking the total time after all ingredients were in the mixer.

"The mix was usually placed in a distributing wagon (buggy) which, like the mixer, rode on the same rails that carried the finishing machine.

[7] Anweisung für die Abnahne der Betonfahrdecken der Reichs-Autobahnen, 1939.

[8] Graf, **Strassenbautagung** 1938, page 170.

[9] Ibid, page 174.

[10] The first official order was issued in 1940.

The buggies had adjustable end gates which permitted placing the concrete in even strips. Previously the reinforcement was placed, as edge reinforcement on all four sides. Consolidation occurred either with tamping machines, or mostly with high frequency vibration.

"The finishing was done as in the U. S. A., but we had almost no bleeding because we used a stiffer mix containing less water.

"4. How did you select your aggregate?—The coarse aggregate was selected. Often morain and other pit gravels were used. The compressive strength, the abrasion resistance and the weather resistance were all considered, as well as previous experience with the material. The water-cement ratio lay between 0.45 and 0.5 by weight (5½ to 6¾ gal. per bag). The slump test yielded only a slight deformation. We tested consistency by a penetration test, the indentation ranging from 4 to 8 cm. when a 15 Kg. cylinder having a 10 cm. diameter with a spherical end was dropped 20 cm.

"5. How did you test your concrete quality?—All details of the concrete were tested continuously with special attention to the grading, to the flexural and compressive strengths. For this purpose special engineers were assigned and were responsible to the building direction.

"To fully answer your questions, one would need to write special essays. I propose that the above information be suitably used and that you request the editor to print this article. Then it will become apparent on which parts special reports should be made. It would be best to add a second part on cement and cement testing."

New Batching Plant

UTAH SAND AND GRAVEL PRODUCTS CORP., Salt Lake City, Utah, is constructing a new ready mixed concrete batching plant, which, when completed, will have a capacity of 150 cu. yds. of concrete per hr. The addition, all new equipment, includes an elaborate conveyor system with which aggregate will be carried directly from the existing sand and gravel processing plant and from stockpiles. A large stationary concrete mixer also is being installed so that the product may be sold directly from the central plant to customers who have their own containers. The plant addition is designed so three units may be loaded with ready mix simultaneously. W. E. Ryberg is president of the concern, and Ezra C. Knowlton, is executive vice president.

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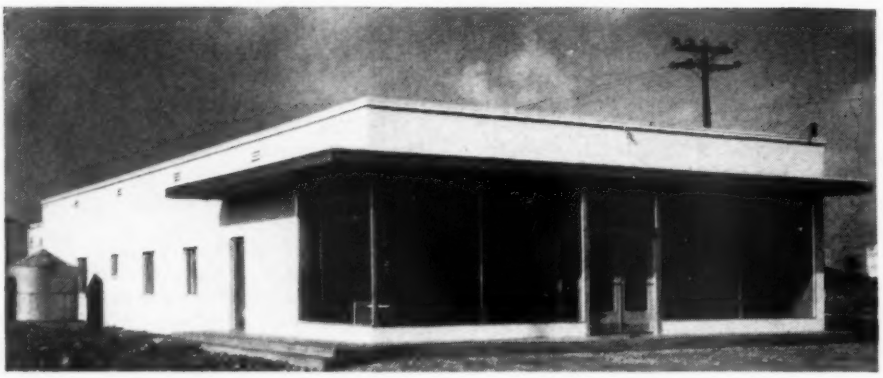
THE OELWEIN CONCRETE CO., Oelwein, Iowa is now in operation. Jake Levin is owner and B. F. Ferguson is plant manager. The ready mixed concrete plant costing over $30,000 includes three mixers with a fourth on order.



Modernistic office structure built with lightweight concrete units

Products Manufacturer Builds Modern Offices

BELIEVING that the best advertisement for a business is to use its own products, Black-Brollier, Inc., manufacturers of concrete block and concrete pipe has erected a modernistic air-conditioned concrete structure at 3010 Dixie Drive, Houston, Texas.

Situated on a five-acre tract, which also accommodates one of the company's three Houston plants, the new building, 40- x 120-ft., has a large reception and display room consisting of 1200-sq. ft. Full vision plate glass windows were used so that the company's products on display can be seen easily. It also includes a large sales and conference room with an 8-ft. long table to permit builders and contractors to study plans. Behind this room is a lounge and bar beautifully furnished. A private telephone board has been installed to handle calls from the other plants. All floors are covered with Azroc tile, and indirect and fluorescent lighting has been installed.

All walls and partitions are constructed of 12-in. Featherlite block units. The roof is a monolithic concrete slab formed of Featherlite aggregate to increase insulation. The exterior of the building is finished with white cement paint and Black-Brollier Anti-Hydro waterproofing. Inside walls are plastered and painted.

George Black, Ernest Black, and Lee Brollier have been firm officials since the company's inception in June, 1936. There are now three large, modern plants. Plant No. 1 consists of large warehouses where adequate stocks of all products are available, and the 803 Blodgett street address is also the location of a Brooks-Taylor lime putty plant. Ready mixed concrete is batched at this location. Plant No. 2 at 2200 Buffalo Drive manufactures concrete pipe, drain tile and septic tanks. Plant No. 3 at 3030 Dixie Drive manufactures concrete block. Equipment includes a Besser Supervibrapac and Towmotor lift trucks for material handling. A Hollostone block machine has been installed recently for the manufacture of special shapes. A Model R. McCracken and a remodeled Martin pipe machine are used to produce smaller sizes of pipe.

Black-Brollier believes in advertising, using newspaper space and a five-minute radio program called, "According to the Record." A house organ for distribution to contractors, real estate developers, etc., called "Concrete Facts" is also prepared.

Pumice Producer Meeting

GENERAL PUMICE CORPORATION, New York, N. Y., with extensive pumice deposits and processing plant at Santa Fe, N. Mex., held a meeting in Chicago on September 8, at which officers and directors discussed the problem of freight rates, new markets and uses for pumice and pumice concrete. At a dinner meeting, members of the technical press were invited to discuss with the officers of the company the characteristics of the pumice deposit and new uses of pumice concrete.

Present at the meeting were Rayford W. Alley, president of the company; Leonard P. Frieder, vice-president; Fred H. Jackman, executive vice-president; Jos. L. Droege, vice-president; Robert S. Reed, vice-president; and Henry G. Vogel, treasurer. Rayford W. Alley, Jr., sales representative in the Chicago area, and Wilson P. Tanner, superintendent of the pilot block plant project of the company in Lubbock, Texas, attended this meeting. Guests included: Perry Dryden, General Portland Cement Co.; Ernest G. Hurst, and A. P. Rosche, block producers of Hillsboro, Ill.; Don Papineau, publisher of *Concrete;* and Ralph S. Torgerson, managing editor, ROCK PRODUCTS.

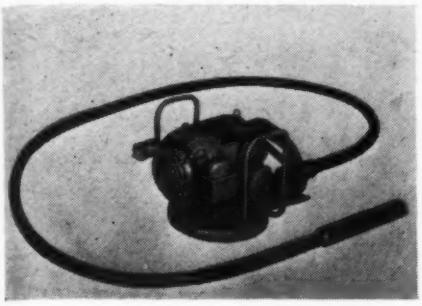
BLUFFTON CEMENT BLOCK CO., Bluffton, Ohio, is constructing a new plant in the area which has a capacity of 10,000 brick and 1800 brikcrete per day. A night shift manufactures tile. Michael Johnson is president of the corporation and Benjamin Amstutz is vice-president and general manager.

J. T. MEYERS has opened the Winnebago tile plant near Blue Earth, Minn., producing six sizes of the tile with a maximum output of 3000 ft. of 6-in. tile. Winnebago Sand and Gravel Co. is furnishing the sand.

NEW MACHINERY

Electric Concrete Vibrator

STOW MANUFACTURING CO., Binghamton, N. Y., has added a line of electric concrete vibrators to its previously manufactured line of gasoline



Electric concrete vibrator added to manufacturer's line of gasoline powered vibrators

powered vibrators. Model HE, with a 2½-in. vibrator head, has a speed of 6000 vibrations per min. and is powered by a 3 hp., 220/440 volt, 60 cycle, 3-phase motor. Model JE6, with a 1½-in. vibrator head, has a speed of 7600 vibrations per min. at full load and is powered by a 1½ hp., 110/220 volt, 60 cycle, single phase motor. Both models have totally enclosed splash-proof motors, water-tight control stations and cable connectors, ball-bearing countershafts that are adjustable for belt tension, and full 360 degree swivel mountings.

Fork-Truck, Crane Combination

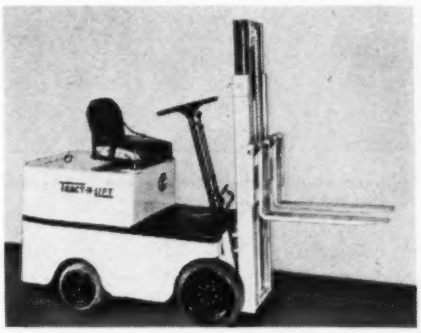
SILENT HOIST & CRANE CO., Brooklyn, N. Y., has announced a lift-truck, crane combination, known as the "Lift-o-Krane," that is available in two models: 5 and 7½ ton. Powered by a Buda 50 hp. engine, the truck incorporates a Timken spiral-bevel heavy duty type differential. Gasoline or Diesel power is optional. Forged, one-piece steel forks may be shaped to suit user needs. Hydraulic power is supplied for lifting or lowering forks or for adjusting height of easily attached crane boom. Separate winch is supplied for crane hoist, operating through a totally enclosed worm gear with built-in constant mesh reverse gear mechanism that runs in an oil bath. These three-wheel trucks have front wheel drive, rear wheel steer. Pneumatic tires or solid rubber tires are optional, as is power steering.

Fork truck specially adapted to pipe handling. Note extra forks that can be folded back when not in use

Fork Lift Truck

TRACT-R-LIFT CORPORATION, Chicago, Ill., has announced its gas-powered fork truck with 2000-lb. capacity at 24-in. from heel of fork. This compact unit measures 28-in. wide by 61-in. long by 60-in. high, and weighs 3050-lbs.

It was designed for operation through narrow doors and aisles and in cramped quarters. Turning radius inside is 6-in; outside 67-in. A single hydraulic lift-and-tilt control lever raises or lowers forks and tilts load forward or backward in any combination of simultaneous movements de-



Compact fork lift truck for cramped quarters

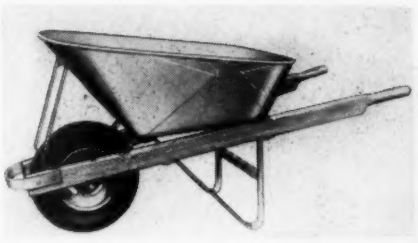
sired by operator. Maximum fork height with 5-ft. mast is 84-in.; with 7-ft. mast, 108-in. Mast has 5-deg. tilt forward and 10-deg. tilt backward from vertical. Speeds up to 10.9 m.p.h. forward and 8.9 m.p.h. in reverse are provided. Power is furnished by a 4-cylinder, water-cooled Waukesha ICK gasoline engine.

Correction

CLARK EQUIPMENT CO., Industrial Truck Division, Battle Creek, Mich., has brought to our attention an error concerning placement of an illustration. The cut appearing in ROCK PRODUCTS, August, 1948, p. 224, under the heading "Fork Truck Pusher," should have appeared in the item headed "Increase Electric Fork Truck Efficiency" on page 218 of the same issue. Both articles describe products of this company.

Lightweight Wheelbarrow

VANCO PRODUCTS, INC., Colorado Springs, Colo., has added a strong, lightweight wheelbarrow of 3½-cu. ft. capacity to its mixer line. The body is made of heavy gauge steel with corners overlapping and welded to provide a double thickness on all four corners. For easy rolling, the wheel-



Wheelbarrow with lapped and welded corners

barrow is equipped with a 4:00 x 8:00 pneumatic tire. A heavy dump-bar extends in front of the wheel to facilitate dumping the load.

Lift Truck With A 10-ft. Reach

THE YALE & TOWNE MFG. CO., Materials Handling Division, Philadelphia, Penn., has announced its 120-in. telescopic Worksaver tilting fork model truck having a capacity of 3000 lbs.

This high reach of 10 ft. combined with a low lowered clearance of 83 in. is accomplished by means of a ram-within-a-ram. When an outer hydraulic piston has fully extended upward, an inner one begins to extend downward, doubling the lift available.

The lift truck travels at 2 m.p.h. under full load, lifts 8 ft. per minute with 2500-lb. load, and tilts a full 18 deg. in 10 seconds. Total weight of the

Telescoping mast permits truck to operate under low headroom

truck, including a 19 plate battery, is 3640 lb. It is guided by a walking operator. The truck is 33 in. wide and 64 in. long.

Two-Wheel Hand Truck

LEWIS-SHEPARD PRODUCTS, INC., Watertown, Mass., is now in production of its "Floor-Master," a lightweight, airplane-type, tubular construction hand truck. This all-purpose hand truck can be furnished in two handle lengths. Axle is secured in tubular housing, and wheels can be furnished in steel, rubber tires, or Celoron, a moulded plastic.

Hand truck with all-welded, tubular airplane-type construction

Pallet Lubricant

NOPCO CHEMICAL CO., Harrison, N. J., has developed Nopcowet B, a water dispersible mixture that may be sprayed or dripped on pallets used by block machine operators. An emulsion of this product applied to the steel pallets as they are fed into the block machine acts as a lubricant and prevents adherence of the concrete to the pallets. It is claimed that unloading of block for storage is facilitated, no time is lost in chipping off the accumulated concrete from the pallets, and fewer misshapen block are produced.

Block Plant Purchases

NEWS of two block plant purchases comes from southern California: Hall Pumice Tile Co., Azusa, bought by Arthur Dixon and William H. Ambrosius from Elmer Delano; and Bell Concrete Block & Tile Co., El Monte, bought by H. Stokes, Frank Collins and Henry Tappa (Bartile Co.) and J. W. Moorehead from C. R. Cady, Curtis Turrill and A. E. Bell.

ROBERT SOLOMAN AND ALBERT MERKEL have purchased a concrete block factory at O'Fallon, Ill., from Russell Schaefer.

SAVE TIME On Every Job WITH A CLIPPER MASONRY SAW

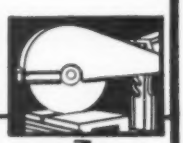
Cuts
- FIRE BRICK
- BUILDING TILE
- CONCRETE BLOCKS

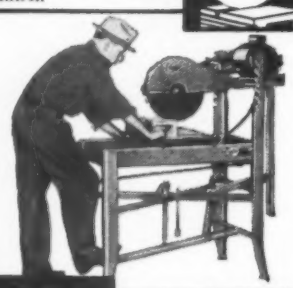
with AMAZING Speed AND Accuracy

• You'll be amazed how quickly and easily you can cut virtually any special length or shape from the hardest masonry materials. Clippers save time — save material, assure better workmanship on every job.

Cuts DRY

Clipper's exclusive design is guaranteed to provide the highest economy with most rapid cutting speed. With or without foot pedal control.





Cuts WET

No dust. With foot pedal control or without. You can set the cutting head in locked position. The hardest materials cut with ease.

FAST and FLEXIBLE

The New Model HD-48 Clipper cuts dry just exactly the same as regular Clipper Masonry Saws.. and for Dustless masonry cutting just turn on the circulating system and slice thru the hardest materials. Proven by ten years use throughout the world. Guaranteed to provide the fastest cuts with lowest cost.

TAILOR MAKE SPECIAL SIZES

Yes . . . with a Clipper it's easy to slice thru Brick, Tile, Concrete, Glass, Marble, Porcelain or any kind of Refractories . . . Straight cuts, Angles or Mitres. CLIPPERS FOR EVERY JOB — Priced as low as $195. Write for Catalog Today!

TRY A CLIPPER FREE

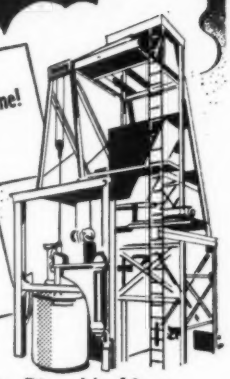
THE CLIPPER MFG. CO.
2807 WARWICK • KANSAS CITY 8, MO.
PHILADELPHIA CLEVELAND ST. LOUIS AUSTIN, TEX.

Universal

Pipe-Making Machines are real profit-makers because they're built by pipe-makers! ... They produce more pipe in fewer man-hours ... at greater profit!

6" through 48" pipe from one machine! Others make from 4" through 72"

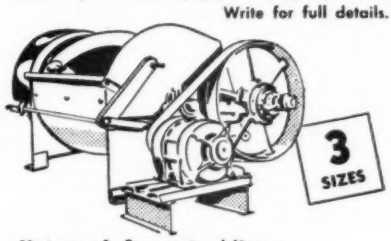
Tamps 680 Strokes per minute



Universal Concrete Pipe Machines

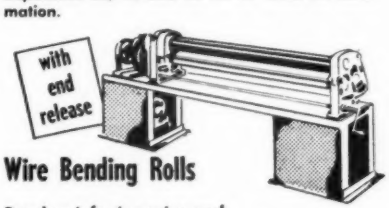
Real money-makers because they make finest ASTM Specification pipe at lowest cost of operation and maintenance. Designed and built by experts with a quarter century pipe making experience.

Write for full details.



Universal Concrete Mixers

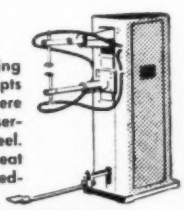
Work horses for manufacturers of concrete products. Simple, dependable over years of continuous operation. Save on first cost and upkeep. Capacities: 28, 42 and 50 cu. ft. Send for information.



Wire Bending Rolls

Bends reinforcing wire and steel plate to any radius, accurately, quickly. Quick, easy removal of completed cages. Extra heavy frame and oversize bearings, with covered gears and overload safety feature.

Wire Mesh Welder



Specially designed for welding reinforcing wire (but adapts for many other uses). Best there is for steady heavy-duty service. Fully enclosed in steel. Water-cooled electrodes. Heat control switch. Swivel foot pedal leaves both hands free.

"It's better to own Universal Equipment... ...than to compete against it!"

Write Today for details, prices
UNIVERSAL CONCRETE MACHINERY CO.
297 South High Street Columbus, Ohio

Gravity Flow Plant

(Continued from page 151)

storage bins and weigh batcher are of Butler design and manufacture. The installation of a bulk cement handling system is contemplated, but at present bagged air-entraining portland cement, delivered in freight cars, is used for all mixes. Water is controlled by volume measurement.

Gravity Flow of Materials

Directly over the block machine is a mezzanine floor supported by an independent steel framework, making it possible to store cement adjacent to the mixer. Concrete is discharged from the mixer to a feed hopper over the 600-block per hr. Besser Vibrapac block machine equipped with a pneumatic off bearer. An Erickson gasoline engine-powered lift truck moves the loaded racks from the machine to curing rooms or from the curing rooms to yard storage in a continuous operation. Empty racks from the yard are spotted behind the block machine for transferring pallets, after which they are moved into loading position by a Barret-Cravens hand truck.

Five curing rooms are provided with a total capacity of 7000 block. These curing rooms, of concrete block and concrete roof slab construction, are equipped with a duct system having an exhaust fan to remove live steam after the initial 6-hr. period, during which the temperature reaches 105 deg. F. Following the live steam period, block remain in the rooms under dry heat for approximately 8 hr. At the present time lightweight block are frequently loaded directly from curing room racks to delivery trucks.

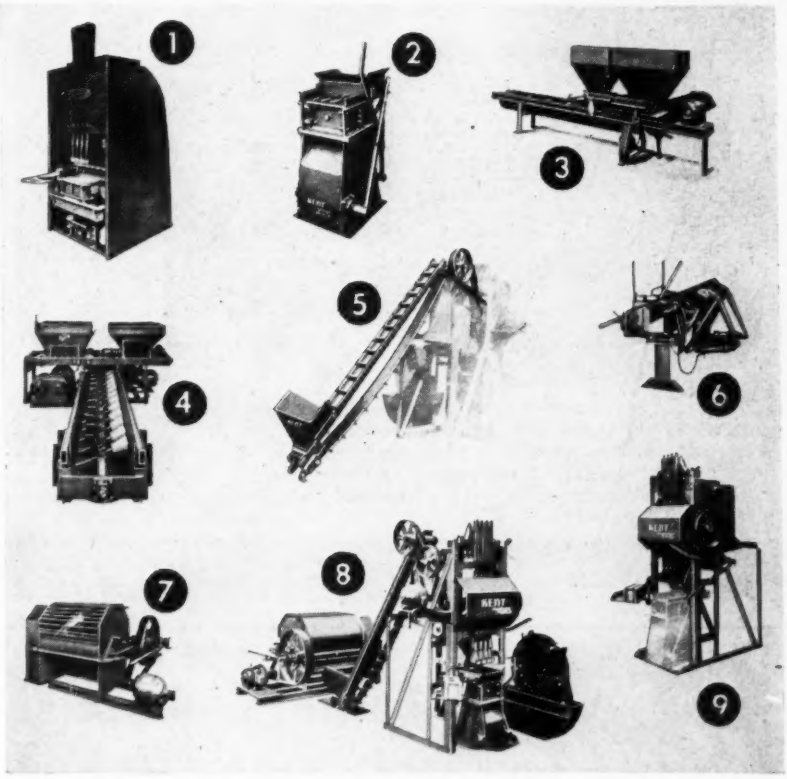
Five sizes of block, all of modular dimensions; that is, 4-, 6-, 8-, 10-, and 12- x 8- x 16-in., are produced. In greatest demand are the 4's, 6's and 8's. In addition to modular building block, the company also produces header and chimney block on the same machine. Schedules are worked out so that the pallets are completely utilized at each operation, with two or three sizes of block being made simultaneously. Special manhole block and catch basin caps (to hold iron covers) are also made. A large market has been developed for chimney block in the area.

Partners in the corporation are Paul C. Taege, president and sales manager; and Frank C. Busse, vice-president and plant superintendent.

Demand for Lightweight Aggregate on Increase

CLEVELAND GYPSUM CO., division of Cleveland Builders Supply Co., Cleveland, Ohio, is creating an increasing demand for PerAleX lightweight plaster aggregate in the area served by the company. The aggregate is mixed with gypsum in the company plant to form an acoustical plaster sold under the trade name of "Hushkote."

STANDARDIZE ON
KENT *Coordinated*
MACHINERY



1 KENT Vibra-TAMP BLOCK MAKER
2 KENT STRIPPER
3 KENT Continuous MIXER
4 KENT Stedifio MIXER
5 KENT Concrete ELEVATOR
6 KENT LINTELator
7 KENT Batch MIXERS
8 Complete KENT Packaged BLOCK PLANTS
9 KENT TAMPER

Write for Illustrated Literature on Any of These Machines

The KENT MACHINE COMPANY
Manufacturers of CONCRETE PRODUCTS MACHINERY *Since 1925*
CUYAHOGA FALLS, OHIO, U.S.A.

ACROW FLOOR CENTERS

Acrow Adjustable Steel Floor Centers provide temporary formwork for fire resisting floor construction jobs using Besser Vibrapac Soffit Tile. Adjustable to various floor spans. Easily installed by unskilled workmen. Replace obsolete, wasteful method of cutting and nailing timber for shoring. Efficient. Economical.

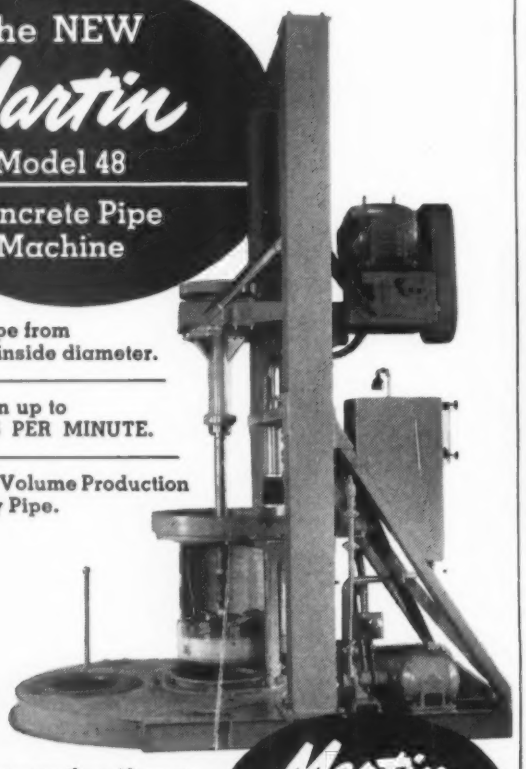
Workman laying floor tile on Acrow Floor Centers.

Acrow Floor Centers make it possible to produce ceiling and floor surfaces of acoustical and insulation value . . . ideal for radiant heating. Reduce labor costs. Supplied by Besser Manufacturing Company with full confidence, after many years of operation, that they will continue to be big time and money saving equipment. Write for ACROW FLOOR CENTER BULLETIN.

Acrow mechanically operated extensible holding fork with extensible cam turning key. Note beautiful exposed ceiling upper left corner after center, in foreground, has been lowered.

[illegible] MANUFACTURING COMPANY, Hillsdale, Michigan, U.S.A.

The NEW **Martin** Model 48 Concrete Pipe Machine



Makes pipe from 4" to 24" inside diameter.

Production up to 2 JOINTS PER MINUTE.

For Large Volume Production of Quality Pipe.

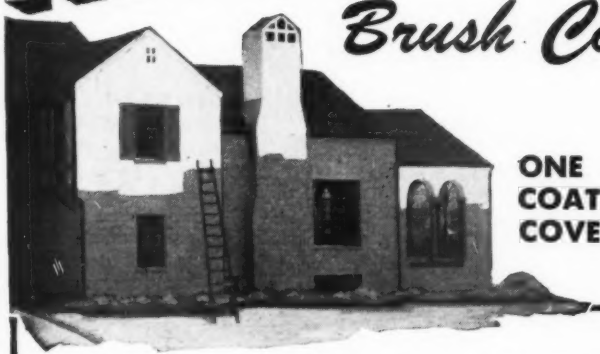
Backed by more than 40 years experience in the manufacture of concrete pipe equipment and irrigation gates and valves.

Write for Bulletin No. 48

Martin
IRON WORKS
Box 2857, Terminal Annex
Los Angeles 54, California

TAMMS AGRASEAL

NEW *Brush Coat*



ONE COAT COVERS

For Exterior or Interior use on Cinder Blocks, Light-weight Aggregate and Concrete Blocks.

AGRASEAL penetrates deep, seals pores, withstands alkali, water, steam, sun, smoke, heat, cold, frost, ice, dampness, etc. • Halts capillary action. • Easily applied with scrub brush. • Comes in powder form—mixes with water. • 7 Colors: White, Ivory Cream, Light Buff, Natural Stone Grey, Sunny Yellow, Light Green and Brick Red. • Packed in 25 lb. steel pails and 100 lb. steel drums.

Sold thru Block Mfg'ers and Building Supply Dealers only!

TAMMS SILICA COMPANY

228 N. La Salle Street, Chicago 1, Illinois

R-M Firms Merge

H. F. THOMSON, president of the General Material Co., St. Louis, Mo., has announced that the business of the General Material Company has been merged with that of Concrete Incorporated, also of St. Louis, and that all contracts for deliveries will be carried out by the latter company. Mr. Thomson has been engaged in the ready mixed concrete business for 21 years, all of it with the General Material Company. He will continue to be identified with the industry but has not yet completed his plans for the future. He was president of the National Ready Mixed Concrete Association from 1933-35. He has recently completed a term as a member of the board of directors of the American Society of Civil Engineers, and is at present a member of the board of directors of the American Concrete Institute.

Cement Base Waterproof Coating

POSS INDUSTRIAL PRODUCTS CO., St. Louis, Mo., is distributing nationally "Stonfil," a cement base water seal for masonry surfaces which is said to permanently seal concrete, stone or precast blocks against moisture penetration, whether applied to inside or outside surfaces, above or below grade. Stonfil is scrubbed into the pores of clean masonry surfaces, expands as it sets and permanently seals these pores against hydrostatic pressures encountered in subterranean structures of great depth.

California Block Meeting

CONCRETE MASONRY MANUFACTURERS ASSOCIATION of Southern California recently held a general membership dinner at the Roger Young Auditorium in Los Angeles, Calif. Principal speakers were George W. Katterjohn, president, and R. E. Copeland, director of engineering, National Concrete Masonry Association. Charles Wailes, Jr., was chairman.

Surveys Texas Housing Conditions

GEORGE W. KATTERJOHN, president, National Concrete Masonry Association, recently spent two days in Dallas, Texas, to survey building conditions in that area. John S. Chase, Chase Building Products, was host to the visitor. The survey is being conducted as part of a nationwide tour to determine critical needs of the industry.

Block Manufacturer Passes

MILTON D. TRITT, retired concrete block manufacturer of Massillon, Ohio, died recently. He had entered the concrete block business in Massillon 33 years ago, and had retired in 1943 because of ill health.

PROTEX AEA* INCREASES CONCRETE DURABILITY OVER 700%

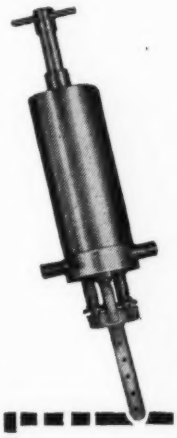
* Air-entraining Agent

Concrete WITHOUT Air-entrainment Silicious Aggregate

This sample failed at 100 cycles of freezing and thawing. Expansion 0.6%. Weight loss 25%. Since 25% loss is considered equivalent to failure, further cycles of freezing and thawing were discontinued on the above sample.

Air-entrained Concrete—4.0% Air Silicious Aggregate

After 300 cycles of freezing and thawing the expansion was 0.2% and the weight loss was 4%. The above sample shows direct advantages that occur through use of air-entrainment in concrete.



This test conclusively proves one of the many important advantages of PROTEX AEA. Also, PROTEX air-entrained concrete is more workable, dumps, spreads and finishes more easily—saves time—labor—money! Gives concrete resistance to alkali-sulphate disintegration, improves resistance to scaling. Can be hauled without agitation, and in general protects the concrete against the usual causes of failure. It's tried! It's proven! Fully approved and widely used by U. S. Government agencies and A. G. C. Contractors. Specify PROTEX and get the best AEA.

LOW COST PROTEX DISPENSER...AUTOMATICALLY DISPENSES PREDETERMINED AMOUNT OF AEA.

Serving industry for 27 years.

FREE BOOK ON AIR ENTRAINMENT

AUTOLENE LUBRICANTS CO.
Industrial & Research Division, Denver 9, Colorado

Please send me your book, "Facts on Modern Placement of Concrete Through Air Entrainment."

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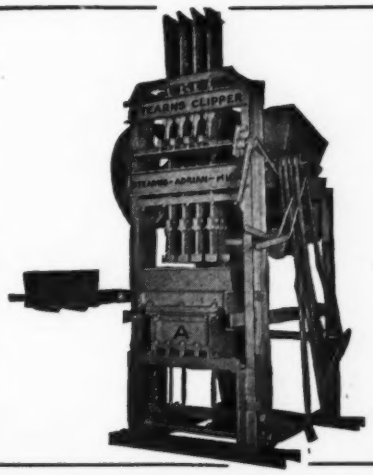


"ANCHOR"

Complete equipment for making concrete, cinder and other light weight aggregate units, including engineering service for plants and revamping of old ones for more economical service. Stearns Clipper Stripper Machines, Stearns Joltcrete Machines; Stearns Mixers; cast Iron and Press Steel Pallets. Straublox Oscillating Attachments, etc.

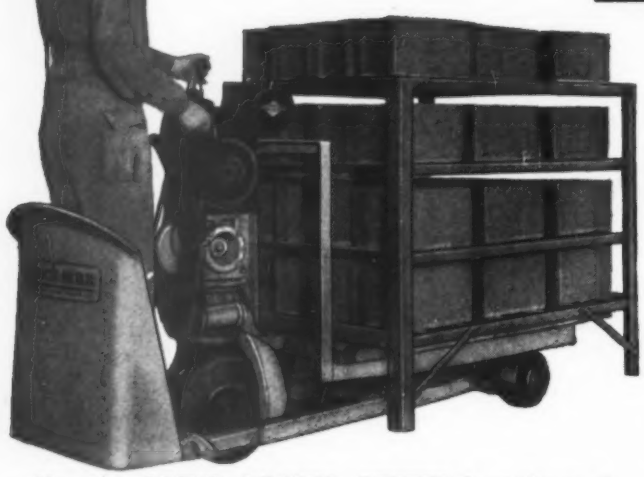
Repair parts for: Anchor, Stearns, Blystone Mixers and many others.

ANCHOR CONCRETE MCHY. CO.

G. M. Friel, Mgr., Columbus 12, Ohio

truck-man

BUILT TO DO BLOCK JOBS BETTER



ASK ANY OPERATOR

$865

f.o.b. factory with 62" Platform

Buy From

TRUCK-MAN'S BLOCK MACHINERY SPECIALISTS

Anchor Concrete Mach. Co. Columbus, Ohio
A. N. Olson Rock Rapids, Iowa
Blatt Sales Co. Tampa, Fla.
Clark-Wilcox Co. Boston, Mass.
Concrete Block Plant Equip. Co., Birmingham, Ala.
Concrete Transport Mixer Co., St. Louis, Mo.
Contractors Mach. & Equip. Co., Hamilton, Ont., Can.
C. H. Jones Equip. Co. Salt Lake City, Utah
C. J. Rahn Co. Newark, N. J.
Witteman Machinery Co. Farmingdale, N. J.
Kent Machine Co. Cuyahoga Falls, Ohio
Fleming Mfg. Co. St. Louis, Mo.
F. C. George Machine Co. Orlando, Fla.
Lith-I-Bar Co. Holland, Mich.
Llewellyn Mach. Corp. Miami, Fla.
R. S. Reed Corp. Three Rivers, Mich.
Sterns-Oakes Sales Co. Adrian, Mich.
Siano & Sons Greenfield, Mass.

Yes, for SAFER, FASTER, BETTER handling of concrete blocks—Truck-Man has what block manufacturers demand:

- Ample capacity—many carry over 60 blocks.
- Easy lift and drop, soft start and stop—handles green blocks gently.
- Hydraulic lift and gasoline power—ease and speed handling.
- Cat-like maneuverability possible only with 360° steering.
- Easy on-and-off, simple and safe operation by unskilled drivers.
- Low first cost, low operating cost, low maintenance cost.

Ask the Truck-Man dealer in your territory about performance, service and economy, or write us for catalog.

truck-man INC.

1413 West Ganson, Jackson, Mich.

PLATEGRIP

PLATE FASTENERS FOR CONVEYOR BELTS

Make strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of from 1/4" to 1 1/2" thickness. *Write for Catalog Sheet.*

ARMSTRONG BRAY & CO.
5366 Northwest Highway, CHICAGO 30, U. S. A.

Also Repair Plates For Mending belts.

JOIN 11,900 PRODUCERS WHO REGULARLY READ ROCK PRODUCTS

Sells Vault Company

J. T. MCCORMICK has sold the Savannah Vault Co., Jacksonville Beach, Fla., and is now employed with B. B. McCormick Sons, Inc.

WILLIAM O'BRIEN has received a franchise for manufacture of "Brikcrete" building block, and will begin production of the brick in Sandusky, Ohio.

AMERICAN CONCRETE BLOCK CO., Shreveport, La., which began production of cinder block approximately a year and a half ago, is now the only masonry producer in North Louisiana and vicinity with gradation control, it is reported. E. A. Hamner and sons, R. F. Hamner and E. A. Hamner, Jr., own and operate the plant.

FALLON CONCRETE PRODUCTS CO., Fallon, Nev., is producing pumice building block at the rate of 1200 per day, firm co-managers Ed Frazzini and Leonard Mackedon, have announced.

FISCHER LIME & CEMENT CO., Memphis, Tenn., is now exclusive distributor for Memphis and the Tri-State area of "Sakrete" ready-mixed products, company officials have announced.

JEFFERSON CEMENT PRODUCTS CO., Jefferson, Iowa, recently celebrated completion of its first year in business. Owen Lawson and Harvey Peninger, owners of the company, state that during that time production of concrete block has been increased from 600 to 2400 per day. Some 80,000 tile and 60,000 block were sold in the year. Plans now are being made for the manufacture of concrete floor joists and cinder block.

CEMENT BRIK PRODUCTS, INC., Ottawa, Kan., has added ready-mixed concrete to its line of concrete brick, block and similar products. Lawrence Ogg is president of the firm, and Gordon Daugharthy is secretary-treasurer.

WELLS DUNBRIK CO., Quincy, Ill., manufacturer of patented Dunbrik and Dunstone building materials, has been sold to Leonard Brower and Billy Cooney and will now be known as the Brower-Cooney Dunbrik Co.

BEATTY PUMICE PRODUCTS CO., Yerington, Nev., has resumed operation after a shut-down of seven months. This pumice concrete block plant has a production of 1500 block per day.

Concrete Floors For Radiant Heating

RADIANT HEATING SYSTEMS, being introduced in many new homes, offer a new market for concrete in that concrete floors are proving to be best suited for such heating installations. The radiant heating coils are usually placed in the center of the concrete slab or embedded in the lower portion. A report by A. M. Byers Co. states that such floors generally do not "sweat" in summer and require no expansion joints.